



Badger chemist : the newsletter of the University of Wisconsin-Madison Chemistry Department. No. 35 1991

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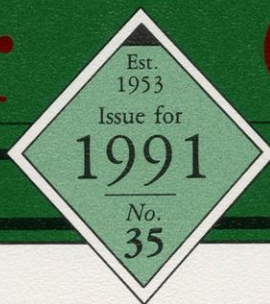
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Badger Chemist



THE NEWSLETTER OF
THE UNIVERSITY OF WISCONSIN-MADISON

CHEMISTRY DEPARTMENT

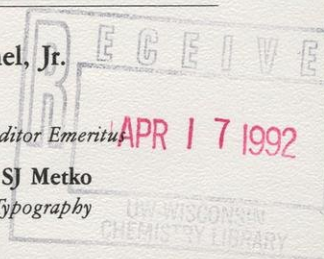
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FROM THE CHAIRMAN



TWO HATS

I WEAR TWO HATS as I write this introduction. First, I write as the editor of *Badger Chemist* No. 35, highlighting the content of this newsletter; second, I speak as department chair, focusing attention on the state of the Department and its current and future goals.

Speaking as Editor: Only a few small changes will be evident in BC 35. It is appropriate to acknowledge the help I have received in preparing copy, thus the inclusion of bylines on some of the short reports on departmental projects. Continuing to emphasize content, and especially the science in the department, I have used the center pages to describe recent developments in the chemical education area.

Aaron Ihde's book on the department history has now been published. Readers may be interested in two favorable reviews that have just appeared: in *Chemical and Engineering News* (January 28, 1991 issue, page 52) and in the *Bulletin of the History of Chemistry*, Vol. 9, pages 34-35.

Speaking as Chairman: I am sure that our readers are aware of concerns being expressed nationally: on the declining numbers of students entering chemistry, on the level of research funding, on a deteriorating economic climate which affects such things as state funding of universities. But in the midst of this, 1990 was a good year for the Department. We are on track, moving toward established goals. Three new faculty members have given the department's research further depth and breadth, and we are closer to goals set earlier. The frantic situation that brought 11 new faculty members to Madison in four years can now be replaced with a slower, measured development. Our new faculty are evident in all aspects of department activities, and we all share in the excitement of their developing research programs. The Department is working well, working together toward common goals.

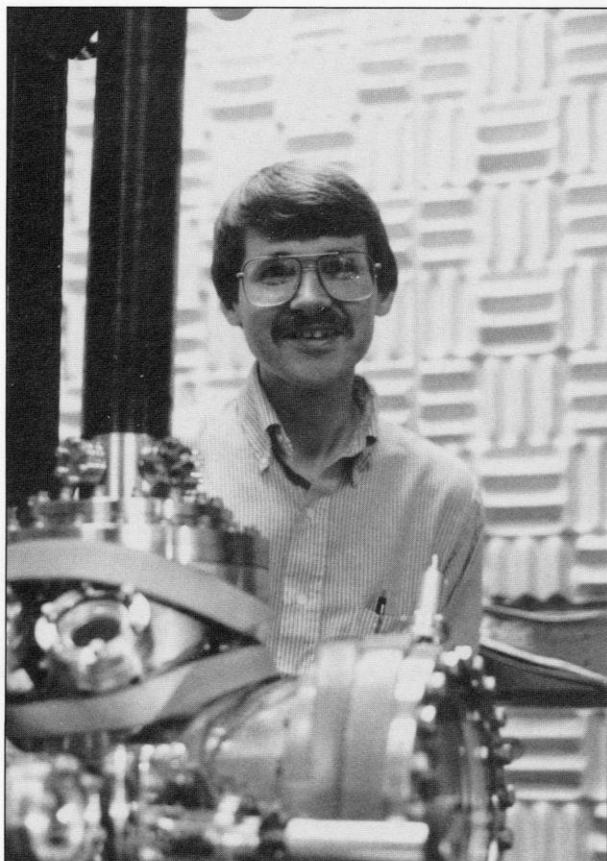
There have been major advances in the teaching programs, with ICE and SERAPHIM leading the way. Faculty commitment to teaching remains high. Jim Weisshaar has revived our honors course, Chemistry 115-116, which was lost to budget cutbacks in the early '80s. Ties between the Chemistry Tutorial Program (soon to be renamed the Chemistry Learning Center) and the Department have been strengthened and formalized.

We have acquired a new departmental computer with NSF, Graduate School and departmental funding. We believe that we are closer to a building addition. There were major national and university awards to faculty, and several notable awards to students.

In retrospect, it seems that I wear three hats. As a colleague and friend, I would like to close my comments by thanking you for the many words of encouragement over the past year. Please continue to write, and send in your comments and news items. The favorable remarks by readers about the last *Badger Chemist* were greatly appreciated and have reassured me that BC is on the right track. We also appreciate the generous gifts over the year to the Badger Chemist Fund and to the Department of Chemistry Fund at the UW Foundation. Your support is important.

Paul Treichel

NEW FACULTY

Robert Hamers

ROBERT recently joined the Chemistry faculty as an Associate Professor in Analytical Sciences. Bob did his Ph.D. research at Cornell University with Paul Houston and Bob Merrill, where he studied the exchange of vibrational, rotational, and translational energy in molecule-surface collisions. After receiving his Ph.D., Bob became one of the first scientists in the burgeoning field of scanning tunneling microscopy (STM). Bob spent 5½ years doing STM research at IBM's T.J. Watson Research Center in Yorktown Heights, N.Y., first as a postdoc and later as a permanent member of the research staff.

Bob has a number of honors, including the Wentink Outstanding Graduate Student Award from Cornell in

1985. While at IBM, he received the IBM Corporation Innovation Award in 1987 for accomplishments in STM and a Corporate Research Division Award in 1989. Soon after arriving at Wisconsin, he was chosen to receive a Dreyfus New Faculty Award.

Here at UW, Bob is applying STM, tunneling spectroscopy (which provides a kind of chemical contrast) and related techniques to study the structure, reactivity, and electronic properties of individual atoms and molecules at surfaces. Many surface processes are controlled by surface inhomogeneities and defects which occupy a relatively small fraction of the total surface area. Bob's group is developing new STM-based techniques and

applying these techniques to probe how these defects, adsorbed atoms, and other surface inhomogeneities affect chemical reactivity and other physical properties at the atomic level. On semiconductor surfaces, Bob's efforts center around the development and use of STM-based techniques to study how atomic-sized defects modify the electronic properties of the semiconductor. On metal surfaces, Bob's group will be using STM to study the effects of "promoters" and "poisons" on chemical reactions by directly imaging the individual atoms and molecules on the surfaces of transition metals. The ultimate goal of these studies is to establish relationships between atomic structure, electronic structure, and chemical reactivity at surfaces on an atom-by-atom basis.

Bob was born in Kenosha, WI. He did his undergraduate work here at UW-Madison, where he began his research career as a freshman doing undergraduate research in John Wright's group in 1977. He received his B.S. in 1980.

Jim Skinner ►

JIM joined the faculty as Joseph O. Hirschfelder Professor of Theoretical Chemistry. He received his BA in 1975 from UC-Santa Cruz with Highest Honors in Chemistry and Highest Honors in Physics. He then went to Harvard, where he was an NSF Graduate Fellow, and received his PhD in Chemical Physics in 1979. After an NSF postdoc at Stanford, he joined the chemistry faculty at Columbia University in 1981, and was named Professor of Chemistry in 1986. During his Columbia years he was an NSF Presidential Young Investigator, an Alfred P. Sloan Fellow, a Camille and Henry Dreyfus Teacher-Scholar, and in 1989 he received the Phi Lambda Upsilon Fresenius Award. He spent a sabbatical year in 1987 at the Institute for Theoretical Physics at UC Santa Barbara, and at the Department of Physics at the University of Grenoble. He has published over 55 papers and has presented over 75 invited lectures at universities, corporations, and conferences.

His field of research is theoretical chemistry of condensed phases, and his work has included projects involving nonequilibrium statistical mechanics, chemical reactions, polymer dynamics, exciton and electron transport, proton transfer, optical and vibrational dephasing and spectroscopy, nonlinear optical processes, and the glass transition. He and his group of four students are currently studying Anderson localization in disordered systems (with applications to the metal-insulator transition in doped semiconductors), the spectroscopy and dynamics of probe molecules in liquids and amorphous solids, and the approach



are diverse and the methods under development have quite general applicability. For example, his group is currently developing molecular mechanics computational programs for transition metal complexes, exploring the application of NMR methods for the characterization of three dimensional structures of small molecules, creating new multi-conformational computational models for analyzing NMR structural information, performing detailed mechanistic studies of hydroformylation catalysts, and designing and synthesizing new metal complexes for highly selective transformations of organic substrates.

Clark has come to the UW as half of a "package deal;" his wife, Beth Graue, is a beginning assistant professor of Education in Curriculum and Instruction. Her research explores how educational policy reflects the way that people think about young children and their education (e.g., the beliefs of parents, teachers, children, and policy-makers about school readiness).

Born and raised among the expansive cornfields of central Illinois, Clark's arrival in Madison marks a return to the Midwest. He received his Bachelors Degree in Chemistry from the University of Illinois at Urbana-Champaign. •

to equilibrium of quantum systems strongly coupled to their environments.

Jim was born in Ithaca, NY, and spent his early years there before moving to Palo Alto, CA when he was 12. Despite his bicoastal upbringing, education, and professional experience, he thinks Wisconsin IS a great place!

University of Colorado at Boulder where he spent four years as a junior faculty member before his appointment to our faculty.

Although the research program of the Landis group focuses on understanding and designing highly selective homogeneous catalysts, the techniques employed

Clark Landis ►

CLARK is a recent addition to our faculty, filling a vacancy in the Inorganic Division at the Assistant Professor rank. Experiences in both academia and industry have preceded his arrival at Wisconsin. Clark performed his graduate work at the University of Chicago working with Jack Halpern on mechanistic aspects of homogeneous, transition metal catalysts. For this work, which revealed that the origin of selectivity in these enzyme-like catalyst systems was opposite to the premises of the Fischer lock-and-key model, Clark received the PhD and the Mark Galler Award for Most Distinguished Dissertation in the Physical Sciences in 1983. Beckoned by the Sirens of industry, his next stop was the corporate research lab of Monsanto Company in St. Louis. Driven by strong interests in fundamental research and a desire to teach, in 1986 Clark moved to the



FACULTY NEWS & STAFF

Faculty

MARK EDIGER'S strong case for promotion to Associate Professor with tenure sailed through the Physical Chemistry Division, the Department, and the Grad School's Physical Sciences Division and was approved by L & S Dean Crawford and the UW Regents in late spring. Mark's area of research involves polymer dynamics, and his work has permitted characterization of polymer motion at a level of detail and precision not previously obtained. He and his students have studied local segmental motions in polymers using laser optical methods over a wide time scale range, 10^{-10} to 10^4 seconds, supplementing this work with computer simulations and carbon-13 NMR experiments.

In a major reorganization at NSF, **Bassam Shakhshiri's** position as Assistant Director for Science and Engineering Education at NSF was eliminated. Many of you may already be familiar with this story, as it was reported in several scientific magazines (e.g., *C & EN*, June 4 and June 25; the *Chronicle of Higher Education*, June 13) and the national press.

The functions of this directorate were combined with NSF's programs for women, minorities, and handicapped individuals in a new unit called the Directorate for Education and Human Resources, to be headed by Luther S. Williams, former President of Atlanta University and a senior science associate in NSF Director Eric Block's office. Bassam faced the choice of reassignment at NSF (he held a career government service job from which he could not be dismissed) or returning to Wisconsin where he had been on leave for the past six years. He choose to return; however, he has held his options open, negotiating a leave of absence from NSF. Reportedly, he will decide whether to return to

NSF in spring when a new NSF Director has assumed office.

Meanwhile, Bassam is back teaching in his familiar 11:00 am MW Chemistry 103 lecture slot. On December 10th and 11th he presented his 21st annual Christmas lecture. **Rodney Schreiner** (PhD '81, Ellis) and Bassam continue to work on the book series, *Chemical Demonstrations*, of which three volumes have now appeared.

Academic Staff

WE welcome **Steve Gammon** to the Department. Steve is now permanently established as the General Chemistry Laboratory Director. Actually, he is not new on the scene since held this position on a temporary basis the preceding year. Steve came to Wisconsin in summer 1989 after completing graduate study at the University of Illinois at Champaign. His graduate studies there were carried out jointly with Tom Rauchfuss (organometallic synthesis, on organosulfur-metal clusters) and Stan Smith (Chemical Education, Interactive Videodisc software development). In conjunction with work in the latter area, he also held a position as Project Manager with Communications Alliance in Springfield, IL for which he was designer of a prototype interactive videodisc-based civil service test for the State of Illinois. His expertise in this area is being put to extensive use here with the changes in our general chemistry teaching program.

Officially, **Gery Essenmacher** (PhD '76, Treichel) is now the Coordinator of General Chemistry. Gery had served as General Chemistry Laboratory Director from 1984 to mid-1987. At that point, **Glen Dirreen** (PhD '72, Treichel) moved to the position of Associate Director in the Institute for Chemical Education (ICE) on a full time basis, leaving the

position of Coordinator open. Gery filled in as interim Coordinator while retaining his full Laboratory Director responsibilities. This was intended to be a short term, interim situation; instead it turned out to be 1.5 years until we secured permission from the Dean to fill the Laboratory Director position and hire Steve Gammon.

On the basis of yeoman service to the department and a new set of responsibilities, the Department recommended to the Dean that Gery be promoted from Associate Faculty Associate to Faculty Associate; this promotion was approved in spring, 1990. At the same time, we recommended a promotion of Analytical Chemistry Laboratory Director **Matt Sanders** (PhD '83, Wirth); his promotion from Assistant Faculty Associate to Associate Faculty Associate was also approved. Matt has been an essential factor in the success of the advanced analytical chemistry labs (Chemistry 524, 621, and 630) and in development of new experiments for these courses and for the new course in biochemical separations offered a year ago and described in BC 34.

Lest the titles of these laboratory directors be a puzzle, a brief explanation is provided. About five years ago, the state legislature mandated setting up a consistent set of titles for academic staff members within various institutions in the state. Our Department's six laboratory directors, with primary support responsibilities to our instructional program, received the formal title of Faculty Associate. The retitling exercise provided for grades in a given title by prefixes, mostly following the professorial prefixes of Assistant, Associate, and "unprefixed". This led to seemingly redundant titles such as "Associate Faculty Associate".

To make matters simpler (or more complicated?), academic staff members can retain "working titles" if they like. Thus we still refer to our laboratory directors as laboratory directors, except of course in correspondence with higher levels of administration.

Other formal titles of academic staff members in Chemistry include "Scientist", "Instrumentation Innovator", "Instrumentation Spe-



cialist", and "Program Manager".



Cathy Middlecamp (PhD '72, West) has been officially appointed Director of the Chemistry Tutorial Program. Cathy had been the Associate Director of the program under previous Director Betsy

Kean and she held the position of Acting Director during 1989-90. Ties between Chemistry and the Chemistry Tutorial Program have been strengthened in the last two years. When originally established in 1974, the Chemistry Tutorial Program was administratively separate from the Department. The Department has now assumed some responsibility for the Tutorial Program (ties to minority programs on campus still remain in place), and Cathy's involvement in the General Chemistry Division and the Department has increased.

One of the most interesting developments in academic staff appointments involved **Paul Schatz** (PhD '71, Whitlock). Paul has put in exemplary service in the Department as Organic Chemistry Laboratory Director for 20 years. This year, we gave Paul time off from his regular duties. In fall, Paul taught Chemistry 343, first semester undergraduate Organic lecture. Part-time in the fall semester, and full time in the spring semester, Paul will serve as a Project SERAPHIM Fellow, thereby getting the chance to develop a computerized database and videodiscs for use in the organic lecture courses. In a sense, this is an internal sabbatical for Paul. Chairman Treichel outlined these plans, which involved some L & S funding of Paul's appointment. When the Dean responded that "the UW did not have a sabbatical program for its academic staff," Treichel had the opportunity to say it was time to institute such a program and that he could think of no better case than this. The rest is history.

A second academic staff member from the department is also on sabbatical leave this year. Dr. **Glen Dirreen** (PhD '72, Treichel), long time General Chemistry Laboratory Director and Coordinator (and more recently, Assistant Director of ICE) is on leave for the 1990-1 academic year to serve as a lecturer in general chemistry at the University of California-San Diego.



Awards, Awards

THREE UW Chemistry faculty members were among the recipients of national ACS awards at the Fall 1990 ACS meeting in Atlanta: **Chuck Casey** received the Award in Organometallic Chemistry, **John Moore** was honored with the Pimentel Award in Chemical Education, and **Howard Zimmerman** was named to receive one of several Cope Scholar Awards.

Jim Skinner, who has just joined the faculty, was designated by Phi Lambda Upsilon to receive the Fresenius Award. This award (sponsored by the honorary chemistry fraternity) is given to a chemist under the age of 35.

Alone, that would be an exceptional record; four national awards in one year has not been seen in recent history, at least to our knowledge. However, the record for the year went much further.

Two faculty members were named to university chairs. Both chairs provide a significant multi-year allocation of research funding.

Tom Record received a University Houses Chair. Administered by the Graduate School, funds for this award come from revenue generated by a trust fund of the faculty housing unit of this name. One of the provisions of the award is that the recipient can name the chair in honor of a former colleague or mentor; we were pleased when Tom chose to honor Emeritus Professor John D. Ferry in this way.

In late spring, **Howard Zimmerman** was named as recipient of a Hilldale Chair, one of several university chairs administered by the Chancellor's Office. The Hilldale Trust provides funding for this award. The Trust also funds the Hilldale Awards; notably, Howard was the recipient of a Hilldale Award in the Physical Sciences last year.

Gil Nathanson was chosen for a PYI (Presidential Young Investigator) award by NSF, the sixth such award to a member of this Department. **Sam Gellman** received an ONR Young Investigator Award. Sam came out on top in a competition among 57 nominees from all of the major universities in the country.

One week before he came up for tenure review, **Mark Ediger** received

notification that he had been given a Sloan Foundation Fellowship. This was "frosting on the cake" so to speak; as noted previously, Mark breezed through the tenure review.

Visiting Faculty

DR. DIETER SCHINZER, from the Institute for Organic Chemistry at the University of Hannover, Germany, was a visiting Associate Professor in the spring semester and taught Chemistry 343. **Claire Tessier**, Senior Research Associate from Case Western Reserve, served as a visiting Assistant Professor during part of that semester; she taught a portion of Chemistry 713 while **Bob West** was on leave in Israel.

There were two visiting faculty on the teaching roster in the fall semester. **Albert Thompson** was here through an exchange program with Spelman College in Atlanta; his counterpart is Math professor **Steven Bauman** who spent the fall semester at Spelman. Albert taught Chemistry 108 during the fall and collaborated on research with Art Ellis's group. The department also welcomed **Reinhard Bruckner**, from Marburg, Germany. Reinhard taught Chemistry 343.

Other News from the Faculty

PHIL CERTAIN is Science Coordinator for the Alliance for Undergraduate Education, a consortium of the nation's largest public research universities. He organized a conference, "The Freshman Year in Science and Engineering," held at the University of Michigan in April, 1990. **John Moore** and **Art Ellis** also attended that meeting.

Fleming Crim visited Moscow and Leningrad to attend USA-USSR Workshops on Nonlinear Laser Interactions and Molecular Dynamics, and spent a month at the Max Planck Institute in Gottingen, Germany, in the summer of 1990.

Larry Dahl received the John C. Bailar Medal at the University of Illinois and the First Alumnus Fellow Award from the College of Arts and Sciences at the University of Louisville. He also presented lectures at the Fenske Retirement Symposium at the Miami Beach ACS meeting, at the Inorganic Chemistry Gordon Research Conference at Brewster Academy,

NH, and at the 14th NSF Organometallics Workshop in Lexington, KY.

Art Ellis is chair of the ACS Inorganic Division's Solid State Subdivision in 1990, and also Chair of the UW Materials Science Program since September.

Don Gaines received a BUSA award for Distinguished Service in Boron Science USA Workshop in June and attended the 7th International Meeting on Boron Chemistry in Torun, Poland in July.

John Harriman continues to serve as Associate Chair; he is also a member of the UW Campus Planning Committee, the group that, among other things, makes recommendations on major construction projects for this campus.

Hans Reich attended the Hawaii Pacific Basin Chemistry Conference in December, 1989. He continues to teach a section of the annual ACS short Course, "Frontiers in Organic Chemistry" at Stanford University (with former UW colleague Barry Trost, Chuck Casey, and several others). This week long course was initiated in 1982 at Wisconsin and is the most successful short course offered by the ACS. He also presented seminars at his PhD department, UCLA, at the University of Santa Barbara, and at the University of New Mexico.

Dan Rich was elected Vice Chair of the Medicinal Chemistry Division of the ACS for 1991; he will then serve as Chair in 1992.

Lloyd Smith is a member of the NIH Special Study Section on the Human Genome, and he served on NIH and DOE Site Visit teams at Stanford Research Institute, University of Utah, and Los Alamos National Lab. He was Organizer and Chairman of the ACS Analytical Division's Symposium at Washington entitled, "The Human Genome Initiative: New Challenges in Analytical Chemistry."

Ed Vedejs is in his last year of service as NIH as Chairman of the Medicinal Chemistry Study Section. He continues to serve as a member of Editorial Board of Organic Syntheses (he has been on the Board for eight years). In summer, 1989, Ed spent 6 weeks in Bologna, Italy as visiting professor. He traveled to various conferences in Korea, Pakistan,

Canada, and Finland. Ed gave us this brief sketch on his research:



"...Students from the 1970's and 1980's may be surprised that sulfur chemistry is almost extinct in the Vedejs group; however, the theme of heteroelements in synthesis is alive and well. Interests are shifting to boron chemistry, and the group is still wrestling with phosphorus, nitrogen, and tin heterocycles... The group is moving away from macrocycle chemistry. The macrolide projects have been completed or phased out, and the cytochalasins project should be finished soon. Much of the new chemistry has to do with heteroelement-based asymmetric memory... In addition to the laboratory effort, (current grad student) Steve Fields also produced the Reaction Index database management program that went to market this past year. The same program is being used to maintain a group database."

*

Bob West spent February and March, 1990 in Israel as the Lady Davis Visiting Professor. He also was awarded a Humboldt Visiting Professorship and spent October and November, 1990 in Munich, Germany.

John Wright visited Sandia and Los Alamos Labs, reuniting with former students Dave Moore, Dinh Nguyen, Nigel Cockroft, and his first student at Wisconsin, David Tallant. He also attended the International Luminescence Conference in Lisbon, Portugal and the Europhysics Conference of Defects in Solids at Groningen, the Netherlands. John's family accompanied him on the European trip.

During the summer, 1990, **Hyuk Yu** presented a talk and chaired a session on Polymer Diffusion at a meeting in Crete.

He also gave a seminar at the Weizmann Institute at Rehovot, Israel and served as a consultant at the Korea Institute of Science and Technology. In October, he organized and cochaired the Third ACS Workshop on Polymer Surfaces and Interfaces at the Asilomar Conference Center.

Howard Zimmerman presented Plenary Lectures at Bowling Green State University, honoring George Hammond's retirement, and at the American Society for Photobiology's annual meeting. During summer, 1990, he attended the IUPAC meeting in England, lectured in Germany (Karlsruhe, Marburg, and Regensburg) and visited former colleague and recent UW Visiting Professor Josh Schantl in Salzburg, Austria. There, he and Josh spent considerable time touring the city. Howard drove a tank in the US Army and had lived awhile in Salzburg at the end the Second World War.

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"NOT AT THIS ADDRESS"

After each mailing from the *Badger Chemist* mailing list, we get back 50 to 100 copies marked "Not at this address" and "Forwarding Address Expired". Since the Postal Service is not very good about returning undelivered mail to the sender, we suspect that many other copies of BC are not delivered.

Undelivered mail outside the U.S. is seldom returned. Last year, we asked the group of Badger Chemists outside the U.S. to confirm receipt of the BC if they want to receive future copies. The cost of foreign mailings is a major expense, and we want to avoid sending copies that are not delivered. The result of this experiment was worse than expected; less than one-fourth of the persons on our mailing list responded.

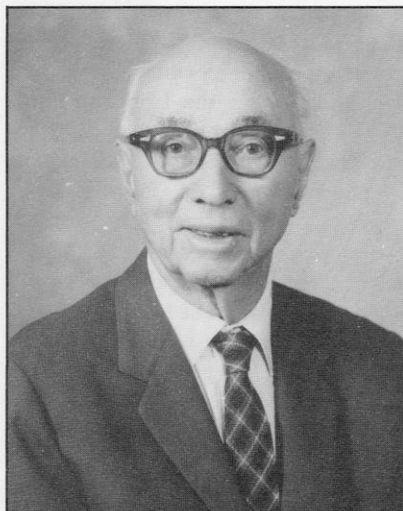
Sadly, at this point we have little choice but to delete many more names from the *Badger Chemist* mailing list.

If you know of persons who should be receiving BC but are not, please send us names and addresses. If you change your address, please let us know and we will update our records. We would also appreciate news items and will include as many as we can in the This 'N' That section.

JOSEPH OAKLAND HIRSCHFELDER

1911

1990



EMERITUS Professor Joseph O. Hirschfelder, age 78, died peacefully in his sleep at his home on Friday, March 30, 1990, after a valiant two year struggle with cancer.

He was born May 27, 1911, in Baltimore, and was married to Elizabeth S. (Betty) Hirschfelder in 1953, who was at that time a member of the faculty in the Department of Mathematics at the University of Wisconsin-Madison.

Joe—as he was known to everyone—did his undergraduate work at the University of Minnesota and Yale. He received his Ph.D. from Princeton, working in chemistry with Henry Eyring and in physics with Eugene Wigner. After studying as a Fellow with John von Neumann at the Institute for Advanced Studies, he joined the faculty of the Department of Chemistry at UW-Madison in 1937, where he remained until his retirement in 1981. He held the Homer Adkins Professorship of Chemistry and was Director of the Theoretical Chemistry Institute, which he founded. After his retirement, he continued to be active in scientific research in Madison and at the University of California-Santa Barbara up to a month before his death.

Professor Hirschfelder is considered to be one of the founders of modern theoretical chemistry. His Ph.D. thesis dealt with the quantum mechanics of the tri-atomic hydrogen molecule, its ion, and the chemical kinetics of these species. During World War II, he developed a system of interior ballistics for guns and rockets and, as a group leader in the Los Alamos atomic bomb project, was the first to predict fallout from atomic bombs. He was the chief phenomenologist at the Bikini bomb test in 1945. He was chairman of the board of editors which prepared "The Effects of Atomic Weapons," published in 1950, from the Los Alamos Laboratory.

After returning to Wisconsin, his earlier interests in the nature of the interactions between molecules and his wartime work on interior ballistics led to extensive study on the statistical and fluid mechanics of reacting gases. This research catalyzed the writing of the "Molecular Theory of Gases and Liquids" with his colleagues Charles F. Curtiss and R. Byron Bird. Published in 1954, this treatise was the fourth most cited book in chemistry and physics for the period 1961-72.

Beginning in the mid 1950s and for about 20 years thereafter, Joe's attention focused on the quantum mechanical study of molecular structure and intermolecular forces. He made important contributions to the degenerate-state perturbation theory and its application to the theory of the interactions between molecules. This evolved into a keen interest in the interaction between molecules and intense laser fields which

occupied his scientific attention up until the time of his death. In his last years, he was intrigued by the implications of non-linear phenomena for the foundations of quantum theory.

He was the author of more than 250 scientific papers and edited, with others, three scientific monographs, "Inter-molecular Forces" (1967), "Chemical Dynamics" (1971), "Lasers, Molecules, and Methods" (1989), and a historical "Reminiscences of Los Alamos, 1943-1945" (1980).

The Theoretical Chemistry Institute, which he founded, has played a major role in the development of theoretical chemistry. Joe's and Betty's keen interest in people and generous hospitality created an atmosphere of lively scientific exchange and cooperation among the leading theoretical chemists of the world. Joe directed the Ph.D. research of 39 students. They and their students have received Ph.D.s in more than 15 different fields in science and engineering, indicating Joe's enormous breadth of scientific interests. The Theoretical Chemistry Institute attracted many postdoctoral scholars and visiting professors and in this way Joe's scientific influence spread widely.

Joe's commitment to the Department was manifested by his gift establishing a professorship in theoretical chemistry and a visitors fund for the Theoretical Chemistry Institute. Last year, the Department acted to fill the Hirschfelder Chair, successfully recruiting Professor Jim Skinner to our faculty.

Joe was elected to the National Academy of Sciences (1953), the American Academy of Arts and Sciences (1959), the Norwegian Royal Society (1965), and the Royal Society of Chemistry of Great Britain (1981). He received the Debye Award of the American Chemical Society (1966), the Edgerton Gold Medal of the Combustion Institute (1966), the National Medal of Science from President Ford (1976), and the Silver Medal of the American Society of Mechanical Engineers (1981). He received honorary degrees from Marquette University and the University of Southern California.

He is survived by his wife, Betty; his sister, Rosalie Akerlof of Walnut Creek, California; and two nephews: Carl Akerlof, Professor of Physics at the University of Michigan, and George Akerlof, Professor of Economics at the University of California-Berkeley.

MEMORIAL COMMITTEE

Phillip R. Certain, Chairman

Charles F. Curtiss

R. Byron Bird



A state-of-the-art lab...news-letter news...an outreach program for kids...rediscovery of Chemistry 115-116...McElvain Seminar Series...and the case of the missing crowds!

GENERAL CHEMISTRY COMPUTER LAB

Over the past few months some exciting changes have come about in the general chemistry program. Through a laboratory modernization grant from the university and a large equipment grant from IBM, we have been able to put together a state-of-the-art instructional computer facility for use in general chemistry. We also have a number of computers in the wet laboratories for instrument interfacing and data acquisition.

The instructional computer facility is in a newly remodeled room (1327) built with technology in mind. The room contains 40 IBM PS/2 Model 55SX microcomputers. All of the computers have hard disk drives, 386 processors, and some even have math co-processors. Many of the above systems are connected to videodisc players and are capable of showing video information along with traditional computer graphics. All of the computers are part of a network, allowing for easy maintenance of student records and printing from each terminal.

All of this hardware enables us to give students many opportunities to learn more chemistry. Some of the software highlights include an expert system tutorial program called "ChemProf" (developed by Cathy Middlecamp, Elizabeth Kean, and Art Eggert). Chem-

Prof is "smart" enough to recognize a student's learning patterns and adjust the level of instruction accordingly. We also have the videodisc-based periodic table database program, "KC Discoverer?". It allows us to extend experiments that the students perform in the laboratory into areas that are too dangerous or complex for the traditional laboratory. One of our most popular pieces of software is a spreadsheet program from JCE Software that allows students to analyze data collected in the laboratory and quickly produce graphs. In addition to our in-house computer software, we have incorporated several commercial products into the freshman curriculum.

Even though our instructional computer room has been in operation for less than a year, it is already being recognized as one of the finest of its kind in the nation. If you happen to be in Madison, be sure to stop by room 1327 to see how the chemistry department is maintaining its lead in chemical education.

—Steve Gammon

General Chemistry Lab Director



ICE CYCLE is a quarterly newsletter published by the Institute for Chemical Education. The publication grew out of the weekly schedule sheet used by the Institute to coordinate the lectures, laboratory exercises, microcomputer sessions, special lectures, and presentations, all of which keep ICE participants very busy during the summer workshops.

With over 1000 people having attended ICE workshops in Madison, and at regional field centers in Ohio, Colorado, the District of Columbia, Arizona, and California, the regular newsletter is an ideal way of allowing the former participants to keep in touch with each other. It is also a means of disseminating information on safety items, special workshops, new lab exercises and lecture demonstrations. We are able to pass along additional relevant information via a newsletter exchange with other professional publications. The mailing list now includes some 2500 science educators across the nation.

—David Shaw

ADDING SOME SPICE

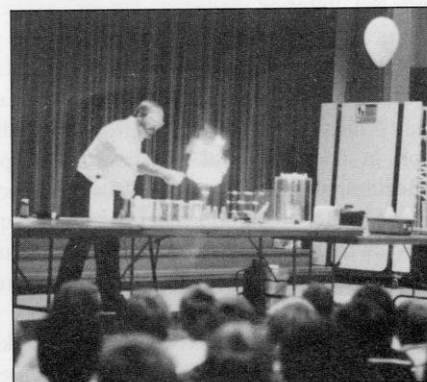
The Institute for Chemical Education (ICE) initiated an outreach program for primary and middle school students during the 1980s. The program brings the excitement and the wonder of science into schools that have few resources.

Under the leadership of John Moore and Glen Dirreen, this program was recently expanded by involving a variety of volunteer presenters from among university students, staff, and faculty. The program has been named SPICE, short for Student-Presented Interactive Chemistry Experiences. Currently, of the 36 volunteers in the SPICE program, two-thirds are undergraduate and graduate students. The organizer is Anthony Jacob, a recent PhD from our department.

SPICE has been successful in meeting several goals. Not only have we stimulated an interest in science among young students, but we have demonstrated to the presenters the importance and satisfaction in communicating science to general audiences. We have fostered good will in the community towards the Chemistry Department and the University, and since a third of our volunteers are women, we have helped provide female role models for young students thinking of a career in the sciences. The need for this program and its success can also be measured by the growing interest shown from local schools. SPICE reached over 7,000 students from area schools during the spring semester of 1990; we expect that number to increase to 10,000 during the current academic year.

If any Badger Chemists participate in or know of programs similar to SPICE, we would like to hear from you so that we can share experiences, information, and chemistry demos.

—Tony Jacob



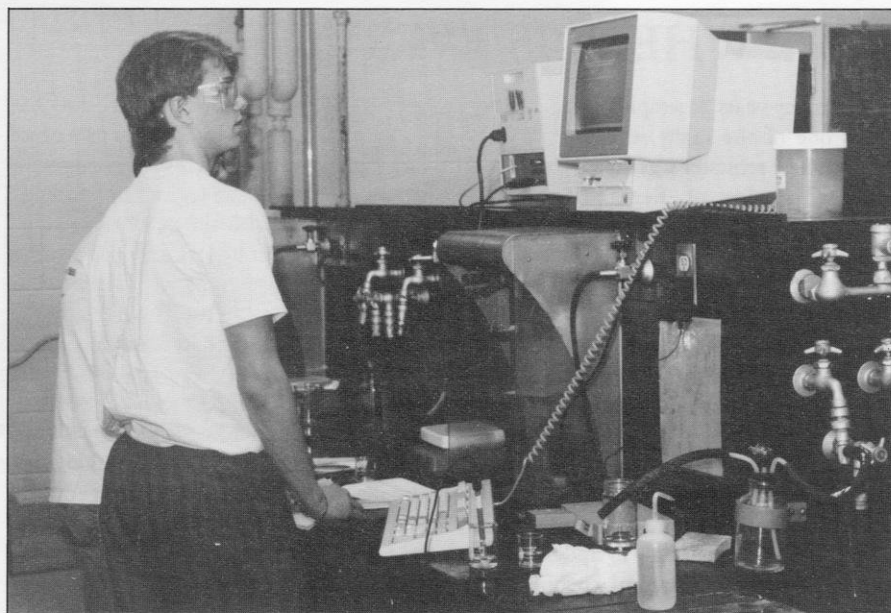
CHEM 115-116 REVIVED!

In the Fall Semester of 1990, we had the unusual opportunity to re-invent Chemistry 115-116, a special chemistry course for about 40 very well prepared, highly motivated first-year undergraduates. [Some of you may remember that Dick Fenske and Larry Dahl taught this course some 20 years ago!] This summer, we sent a course announcement to 500 of the most mathematically-capable members of the incoming freshman class, asking if they would be interested in an intensive, calculus-based course with special laboratories and ready access to both TAs and professor. We received about 70 positive replies, from which we chose the class of 40 students. The 35 students who completed the first semester are truly remarkable!

One of our primary goals in instituting this new course is to bring freshmen closer to the research frontiers of modern chemistry than is typically possible in large lecture courses. A small class of hand-picked students allows us to go into greater depth on fewer topics and to rely on the students to learn some standard material on their own. Perhaps the primary benefit of the small class size is the chance to install more sophisticated laboratory experiments. This is foreseen as an ongoing process over the next few years.

The lecture part of Chemistry 115-116 is team-taught. We decided to build from microscopic phenomena to macroscopic phenomena. Professor Jim Weisshaar spent ten weeks this fall discussing classical mechanics, basic quantum mechanics, atomic structure, and fundamental models of chemical bonding, as well as the kinetic theory of gases and the structure of crystals. Professor Tom Record completed the first semester with the fundamental thermodynamic concepts of energy and entropy. His applications to chemical equilibrium, phase changes, and mixing phenomena emphasized biophysical chemistry.

In the Spring Semester, Professor Gil Nathanson will continue with topics in analytical chemistry, including ionic equilibria, electrochemistry, and chemical separations, with modern chemical kinetics and microscopic dynamics to follow. Finally, Professor Art Ellis will complete the spring semester with selected topics from inorganic chemistry and applications



to materials science. The team-taught design of the course assumes that professors are at their best when teaching the fundamentals of their own research area.

One of the most exciting aspects of Chemistry 115-116 is providing special laboratory opportunities for some of the best undergrads. We began the semester with a battery of synthetic organic and inorganic chemistry experiments chosen to expose the students to basic laboratory techniques while providing surprising or aesthetically pleasing results. More quantitative experiments followed: the neutron activation of silver isotopes with Geiger-counting of the subsequent decay; a colorimetric analysis of solution phase Fe; determination of gas phase atomic weights by sonar measurements of sound velocity; and spectroscopic determination of a gas phase equilibrium constant. For one new experiment, the students used a shoe box, a piece of transmission grating, and some tape to build a hand-held monochromator (estimated cost: \$3.99!) which can measure visible emission wavelengths to an accuracy of ± 3 nm. They recorded and assigned the He spectrum from a discharge lamp, learning about atomic structure and optical selection rules in the process.

In our study of solid state structure, we were fortunate to gain access to the new sphere-packing models developed by Art Ellis, along with Professor George C. Lisensky of Beloit College, and several student co-workers under the auspices of the Institute for Chemical Education.

Students can build their own models of remarkably complex crystal structures by stacking plastic spheres of carefully chosen diameters on metal rods. It is literally impossible to visualize solid state structures without access to three-dimensional models. We supplemented this experience with Lisensky and Ellis' "optical transform" kit. Regular arrays of dots (square lattice, rectangular lattice, hexagonal lattice, etc.) are created by computer graphics and recorded with approximately 0.1 mm spacings on a photographic slide. A red diode laser shone through the slide then produces a beautiful diffraction pattern characteristic of the symmetry and spacings of the dot pattern. This allows students to gain hands-on, quantitative experience with a direct analog of X-ray diffraction, perhaps the most powerful structural tool of inorganic and biophysical chemists, and materials scientists.

Student response to the new course was quite positive. Not surprisingly, the small class size provides a valuable sense of community within this large university. The students have worked enthusiastically at understanding a challenging set of topics. They pepper both lectures and laboratories with penetrating questions, keeping the professor and the TAs on their toes. We see this class as a model for other experiments in small-scale education within the Department and College.

—Jim Weisshaar

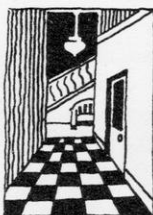
WHERE IS EVERYBODY?

FOR many years, it simply passed as one of the many sure signs that the new semester was about to begin. Thursday of Registration Week brought multitudes of freshmen to the lobby of the Chemistry Building, where the Assignment Committee for all of the General Chemistry courses was located. At any given time during the day there were probably 200 or so wide-eyed freshmen, trying to decipher (from the many posted signs) which sections of General Chemistry were still open. As the day progressed, the frenzy heightened, compelling students to sign up for any section which remained open, only to find out later that they undoubtedly faced a schedule conflict. Even though there were over 20 people available at the Assignment Committee to provide information, several students registered for the wrong course. Obviously, these conflicts had to be worked on throughout the first two weeks of the semester—better known as the Late Registration period—leaving students and teachers unsure of exactly who would remain for the duration of the semester. Those conflicts which could not be resolved resulted in students dropping Chemistry, frustration, and not a few tears.

What a change automated registration has made!

Over 2,000 students still sign up for one of the five General Chemistry courses each semester. But now, most students are able to create a workable schedule of courses on their own and stick to it throughout the semester. All of this can be accomplished at home or dorm, using only a touchtone phone and student ID number. Now, even if students have to sign up for a "dreaded 7:45 AM laboratory section" or want to change sections to be with friends, they can work on changes on their own. Lecture and labwork can be taken more seriously at the beginning of each semester as the number of "section-hoppers" decreases.

Prerequisites are automatically checked by the computer, minimizing incorrect student registration. From an administrative point of view, enrollment in sections can be made more uniform and managed on a more department-wide basis. The lengthening of the registration period allows assignments and allocation of TAs to be done earlier than in the past, fostering more effective preparation and organization of the teaching staff.



The General Chemistry staff has made some changes in our own office procedures, which we feel augment the process of registering so many students with the new system. One of the most beneficial innovations is our inclusion of a "Department Help Line" in the Timetable. With the aid of the university Centrex phone system, this phone number is rotated through the different staff within the department responsible for registering courses chosen first by Seniors, then Juniors, etc. Specific questions and some student advising can be handled effectively over the phone by the most knowledgeable staff. Enrollment is limited pending the filling of less-popularly scheduled sections; once *all* available space is taken, the phone becomes an indicator of the necessity to open more sections.

During the actual registration period, we can adjust the section enrollment "on the fly," limiting enrollment until registration warrants. One set of sections which is scheduled for an evening meeting to accommodate working or special-needs individuals is limited to 10 students per section.

LATE Registration activity, while reduced from prior years, is now handled in one office which is set up with on-line access to ADP and an additional touchtone phone for students to register "on the spot." Openings in sections can be found on line, special exceptions can be made again and entered into the computer, and usually, students can leave the office registered immediately in a section which will meet their needs.

Recordkeeping has been improved with the use of an in-house computer program allowing the Department to directly download student names, ID numbers, classification, and section number from over 100 sections simply by inputting the section number ranges. This file can be downloaded and used to generate updated roster lists for the first day of classes and at any time during the semester. This file also serves as the input for our master grading program.

Dealing with the crowds in the lobby of the Chemistry building—one of the "rites of passage" for students—has now become an efficient interactive process.

—Gery Essenmacher
General Chemistry Coordinator

McELVAIN SEMINARS

The McElvain Seminar Series was instituted in 1980-81 when the Department decided to set aside a portion of the McElvain bequest for a seminar series organized and run by graduate students in the Department. In that first year, students invited four speakers (Malcolm Chisholm from Indiana, Fred Lytle from Purdue, David Evans from Cal Tech, and Don Truhlar from Minnesota). The program has continued and prospered through the '80s, and a total of 75 visitors have been brought to Wisconsin under this program. In 1990-1, eight speakers have been invited to continue this tradition.

In addition to presenting a seminar, the visitors meet informally with small groups of students throughout a day-long visit. This culminates with an informal social hour and then dinner with a number of students.

The program was supported through the McElvain bequest until it was expended several years ago. A short interim period with support from departmental funds followed; then with the help of Karen and Richard Mullineaux (PhD '51, McElvain), a new endowed fund to support this endeavor was established with gifts from Mac's former students and from recent alumni who participated in this program.

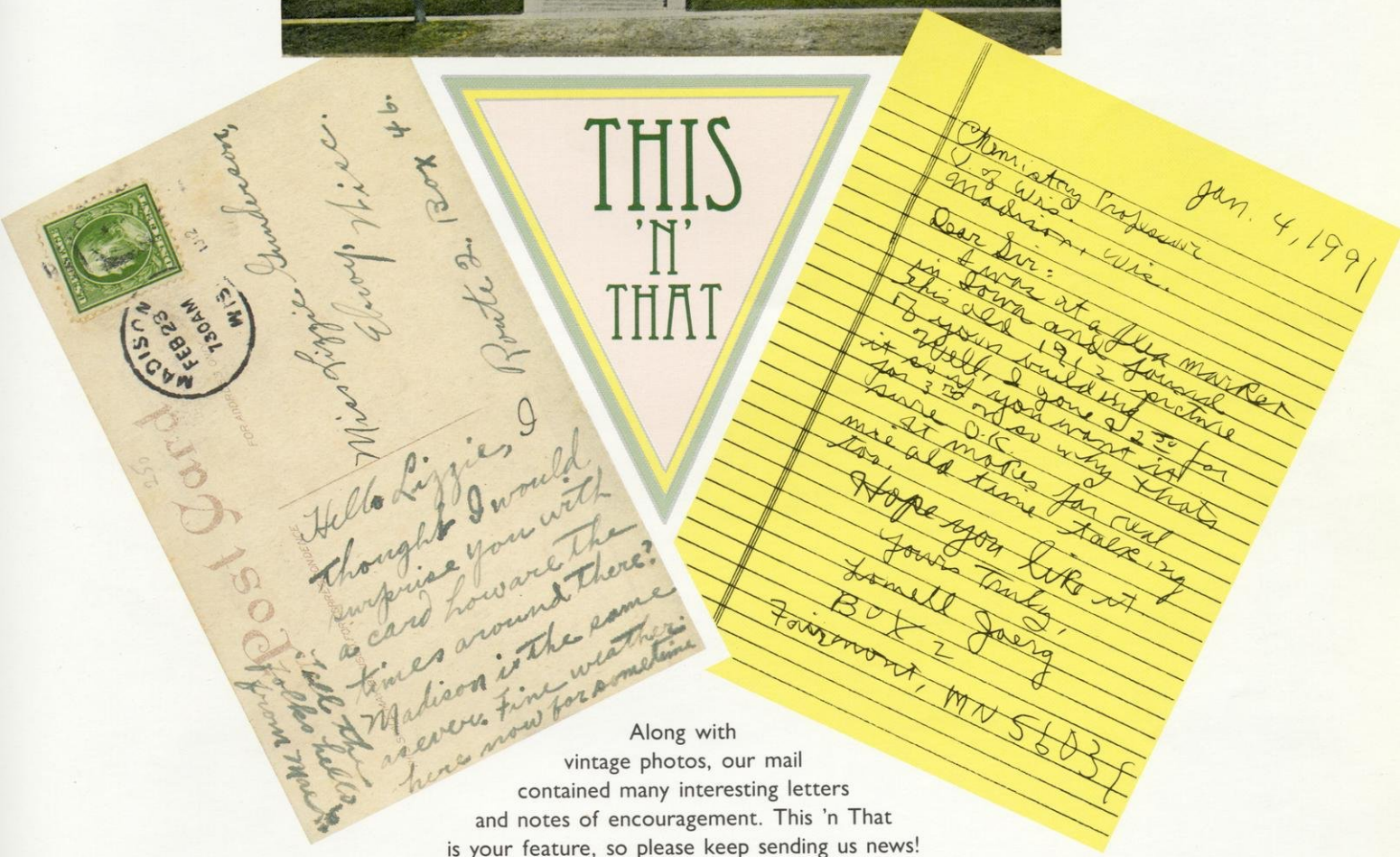
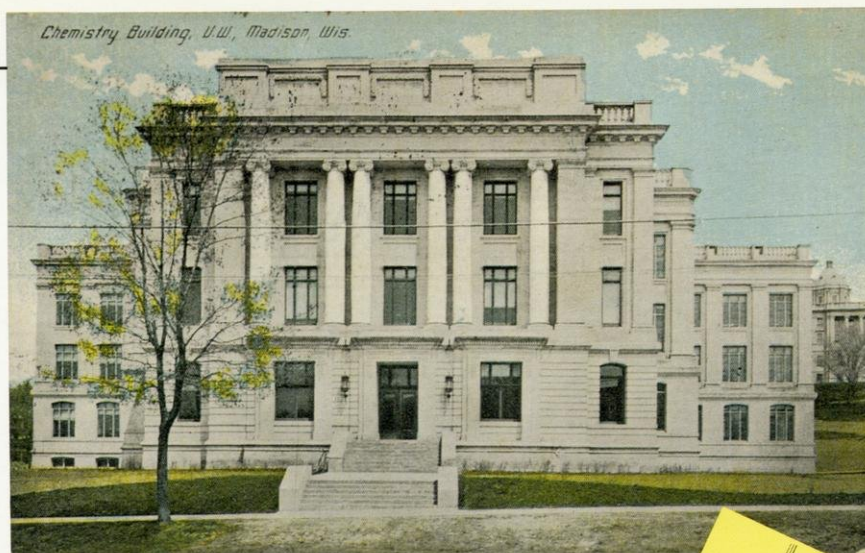
The 1990-1 McElvain Seminar Series participants include: Professor John B. Fenn (Yale), Professor Harry Gray (Cal Tech), Dr. Barrie Hesp (ICI Pharmaceuticals), Dr. Gery McClelland (IBM Almaden), Professor Peter Schultz (University of California-Berkeley), Dr. Lynn Schneemeyer (AT&T Bell Labs), Professor Edward Yeung (Iowa State), and Dr. Nicholas Zumbulyadis (Eastman Kodak).

—Jim Hamilton (Grad Student)

SNOUT OUT, 1990

For the first time in several years, the Department's annual fall picnic was not threatened by inclement weather. About 500 students, faculty, staff and guests were on hand for the festivities on Saturday, September 8, at Hoyt Park.

Let us remind readers that alumni are welcome to attend this function as guests of the department. We have established a regular date for this event, the second Saturday of September, and a regular site, Hoyt Park, on the near west side of Madison. If you are able to attend, please write and let us know of your plans.



Along with vintage photos, our mail contained many interesting letters and notes of encouragement. This 'n That is your feature, so please keep sending us news!

Donald Ames (PhD '49, Willard) retired as General Manager of McDonald Douglas Research Laboratory in St. Louis after 27 years, 18 as Director. Under his leadership, the staff at the Research Lab expanded from 27 to 65 and over 900 scientific papers were published. His laboratory contributed to the Gemini, Skylab, and Mars Lander projects.

Lea Anderson (BS '85) is completing her PhD at MIT with Seyferth.

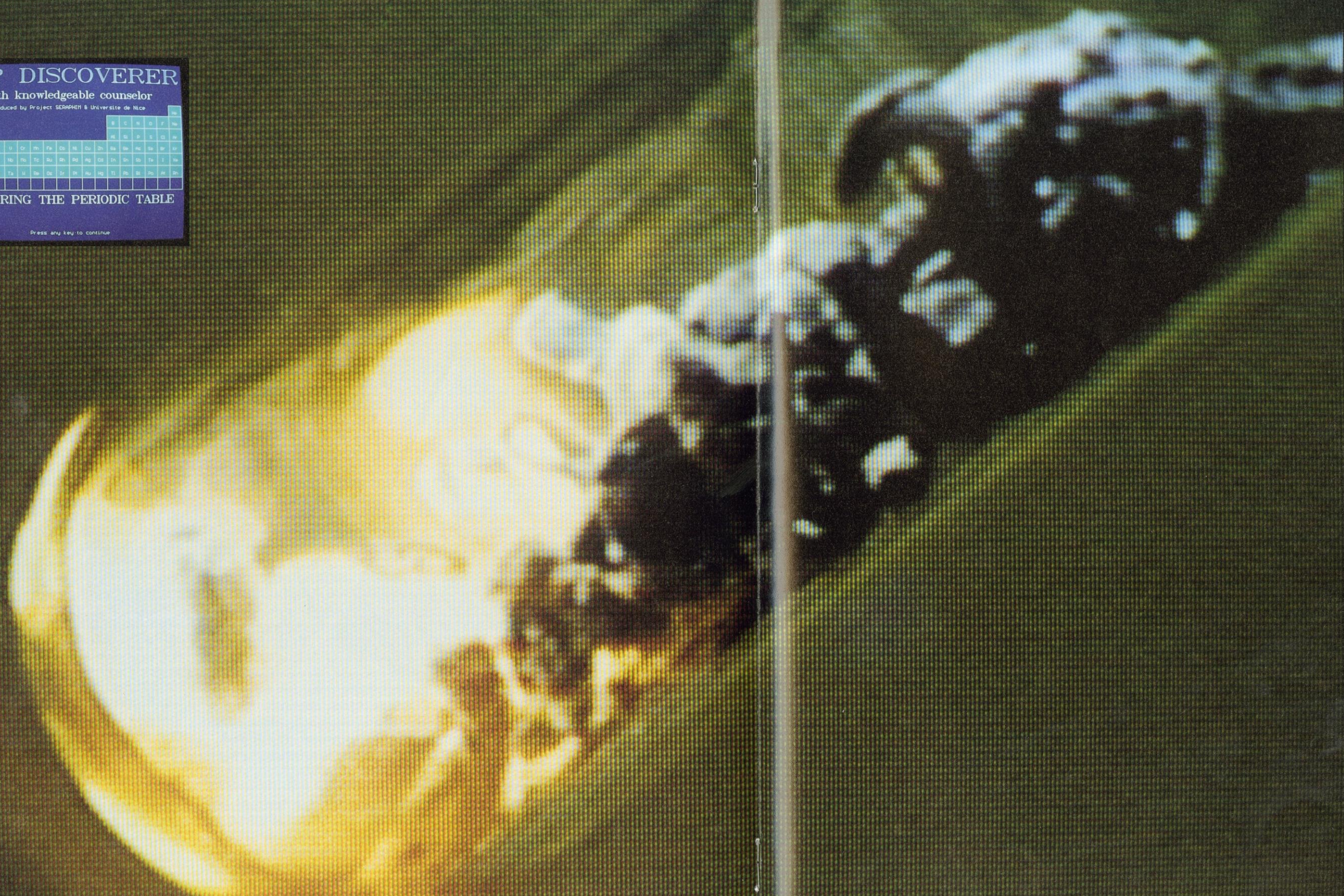
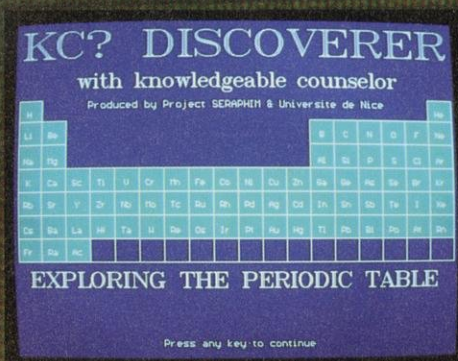
Gilbert Ayres (PhD '30, Walton) writes of enjoying Aaron's book on the History of the Department, recollecting his period of graduate study at the UW. His career includes teaching positions at Smith College and the at the University of Texas from which he retired in 1974.

Bill Beard (PhD '85, Gaines) gave a seminar in November about opportunities in industrial chemistry settings. Bill has been at Ethyl Corp., Baton Rouge, since receiving his degree.

Warren Biggerstaff (PhD '48, Wilds) retired to Emeritus Professor status at California State University in Fresno in 1983.

Monte Blau (PhD '72, Willard) retired in 1983 as Chair of the Nuclear Medicine Department in the NY State Medical School in Buffalo. He lives on Cape Cod and is working one day per week at the Harvard Medical School Radiology Department.

(Continued on page 17)



THE reaction of calcium and air, from a video sequence on the "Periodic Table Videodisc." Chemistry 103 and 108 students use this videodisc and "KC? Discoverer," a computer program, to supplement the laboratory experiment "Periodic Properties," developed by Ed Larsen.

In the "Periodic Properties" lab, students observe and handle a variety of elements and carry out safe reactions. Dangerous reactions are viewed via video in the General Chemistry computer room. Included in the database are more than 40 properties of each element, including color, reaction features, and the date of discovery.

"KC? Discoverer" and the "Periodic Table Videodisc" were created by Prof. John Moore, programmer Aw Feng, and video producer Alton Banks under the auspices of Project SERAPHIM. The program (\$50) and disc (\$75) are available from *The Journal of Chemical Education: Software*, care of the Chemistry Department.



THE VERVIEW

*Election surprises...the big freeze
...money matters...registration
ripples...football woes...stipend
concerns...and snow, snow, snow!*

Incumbent Republican Governor Tommy Thompson coasted to an easy and expected victory in the November election, winning over Democratic Senate Leader Tom Loftus by roughly a 60-40 margin. A big surprise was the defeat of incumbent representative in the second congressional district, Robert Kastenmeier, by Republican Scott Klug, a former TV anchorman. One assessment of the upset was that Kastenmeier underestimated the challenge to his position. He did not effectively counter his opponent's attack that 32 years was too long to serve. In addition, his campaign was hindered by involvement in Washington on the great budget reduction debates. While winning liberal Madison by a considerable margin, Kastenmeier was beaten in the predominately rural, conservative western and northern counties of the district.

Soon after the election, the state released a projection on a potential deficit in the state budget of over \$700 million for the 1990-91 fiscal year. This prompted a freeze on state-funded capital spending, hiring, and non-essential travel. The UW negotiated an arrangement with the state allowing a degree of flexibility for spending in these areas, permitting some spending for the remainder of the fiscal year to meet "exceptional needs."

It is still too early to assess the impact of the freeze, but two items in our department were affected immediately. We are in the middle of a search to fill an entry level organic faculty position, an exceptional need, since both the O'Leary and Goering positions are vacant. An equally big concern was loss of funding for the Laboratory Modernization Program, a special 10 year initiative by the state to upgrade undergraduate instructional laboratories. In previous years, we received Laboratory Modernization funds in Analytical (Instrumental Analysis), Organic (Microscale equipment) and

General Chemistry (Computer Laboratory). Last summer, we were granted \$350,000 for our proposal to upgrade the Physical Chemistry Laboratory. When the freeze hit, we were in the process of implementing plans to replace outdated equipment and add equipment that would enable a series of new experiments. Alumni will remember the Physical Chemistry Laboratory as a pacesetter in this country,



and the Laboratory Modernization funds were seen as a key to sustaining this preeminence. A temporary loss of funding would delay plans; a permanent loss of these funds would be serious indeed.

The freeze does not restrict the use of non-state funds. We are in the process of assembling a new departmental computer system and will soon seek bids on a new ESR spectrometer; both acquisitions will be funded by NSF major instrument grants, with required matching funds being contributed by the UW Graduate School and the Department. Lacking state money, the Department's contribution will have to come from gifts.

Several years ago, UW Madison decided to limit undergraduate enrollment to ensure the high quality of instruction. Smaller numbers of students would mean smaller classes; furthermore, since state funding for the university is not tied directly to enrollment, fewer students

would mean more funds per student.

The university set higher admission standards in the first year of this plan. Students were required to be in the top 40% of their high school class, rather than the top 50%. However, this did not achieve any significant cutback; apparently, this made the campus more attractive because there were almost as many applicants and acceptances as in the previous year, and more students transferred from other UW System campuses. Last fall, the admission policies were revised again. Students in the top 20% of their class were admitted automatically; additional admissions were then made to persons in the next 20% of the class, while monitoring the acceptance numbers. The result was a decrease from over 6,000 to about 5,500 freshman last fall. The overall enrollment on campus did not change, however, with the rising enrollment from the previous years counterbalancing the decreased number of first year students.

The freshman enrollment decrease had a negative effect on our program. It resulted in a decrease of several TA positions and with TA stipends being part of our overall budget, this is a serious loss of funds. In turn, this translated directly to a smaller entering graduate class. Last fall, 45 new students were admitted to our graduate program, lower than the average of about 50 to 55 in recent years.

The size of our graduate program is defined by various factors besides the TA budget, but total research support to the department (for stipends, supplies and services, equipment) is obviously an overriding issue. Funding is defined by the amount of grant and gift funds as well as state funding in various categories. Another critical problem has emerged involving our stipend level relative to peer institutions, affecting our ability to attract a steadily decreasing number of students. This matter is discussed further in "Department" news.

THE BADGER CHEMIST does not usually cover university athletics—you can get timely information from the news media and summaries in other alumni literature. Nonetheless, there is one interesting item to recount. For several

years the serious financial problems of the UW Athletic Department have been in the state news. The football team had its fourth straight bad year in 1989-90, per game attendance slipping to under 40,000 people and the Athletic Department has been laboring under a continuing deficit of several million dollars. The exact amount is hard to pin down because part of the deficit is "deferred maintenance" (upkeep and repair not done for lack of funds). After lengthy debate, the state decided to make the students, faculty and staff of the university bear part of the burden, mandating a \$10 per student per semester fee and raising parking fees by roughly 33% starting last fall. There were loud student protests, but surprisingly little was heard from the faculty considering the rather distasteful aspects of this issue.

And one final bit of news: for the first time since the late 1970s, the university closed down for snow. Over 17 inches of snow (a new record) fell on Monday, December 3. While virtually all local and regional grade and high schools cancelled classes immediately (the standard practice being to notify students via 7 am radio and television news), the announcement for the university came about 10 am, Monday morning. It was somewhat anti-climatic; many faculty and staff had found it impossible to get to campus by car, and the buses had stopped running earlier, pulled out of service after many slid off the road and became stuck. The major effect in the Department was that several evening exams in General Chemistry ended up being cancelled.

Department News

THE most dominant issue within the Department during 1990 involved graduate student stipends; regrettably, it is likely to be a long time before this ceases to be an issue. Over a period of years, our TA and RA stipends have fallen behind those of peer institutions. Data from both formal and informal surveys indicate that graduate students in chemistry at the UW Madison are between \$600 and \$3,000 behind their peers at other institutions. While this differential is offset, somewhat, by a lower cost of living in Madison and the excellent health care benefits, most faculty now believe that this differential has an impact on the Department's ability to

attract the best students to pursue graduate studies here.

Most peer institutions waive all tuition for TAs and RAs. However, for UW Madison graduate students holding TA and RA appointments, only the non-resident portion of tuition is waived; our students are still required to pay resident tuition—about \$3,000 a year. This fact, along with the approximate equivalence of resident tuition with the stipend differential, has made full remission of tuition for UW graduate students an issue on campus.

CONCERNS about stipends have been particularly strong in the sciences and engineering. They were also picked up by the TAA, the union formally representing TAs. The TAA has made the remission of all tuition a primary goal for future contract negotiations. Unfortunately, the cost to waive all tuition for TAs and RAs on campus carries a \$10 million price tag, and the likelihood of the state providing additional funds is small. Likewise, the prospect of the university absorbing a new cost of this magnitude is fairly slim.

A commonly held view is that both the state and the university will never provide funds to fully solve this problem. Within the state government, there is not strong support to provide more funding for tuition remission (which is not regarded as a problem by many). Within the university, funding would become available only if there were unanimity on the nature and extent of this as a problem. With many current needs on campus, high priority for this item is by no means universally accepted.

Recognizing this fact, the Department has begun to formulate its own response to the problem. The Department's Long Range Planning Committee (Crim—Chair; Ellis, Harriman, Taylor, Vedejs) spent the fall semester developing a plan which was presented in December. The Department concurred that the problem was so acute that we should supplement stipends of all students in their first three years. (Students who have three years of residence and have completed formal degree requirements achieve dissertator status, at which time the tuition costs decrease to about

\$1,000 a year.) Implementation of the plan is being discussed at this time.

The ramifications of the plan are most significant, however. The proposal means a higher cost per student, and the finite resources of the department are already being stretched to their limit. A year's lead time before the plan goes into effect should give the opportunity to find additional funds. Realistically, however, it is unlikely that we will find sufficient additional funds in one year; grants are typically funded on a three year cycle. So, a second consequence of this decision is that it will be necessary to decrease the number of students, at least for the immediate future. We expect to do this by admitting a smaller number of graduate students for admission next fall. Hopefully, this will only be a temporary measure.

In discussions on this issue, John Harriman observed that whatever happened, we would have fewer graduate students in the Department in the next several years. Either we would provide a supplement to the stipend and be able to afford fewer students, or, handicapped by a lower stipend, we would attract fewer students. The choice we have made emphasizes quality; a higher stipend would enable us to compete more effectively for the best students.

THE Department reached another milestone decision on this issue, unanimously voting to recommend that the UW Administration establish a higher amount of tuition remission in federal grants so that students with RA appointments would be exempt from any tuition costs. In effect, this recommendation is asking the UW administration to raise overhead rates with granting agencies. The strong position taken by faculty in the past has been to limit overhead costs on grants. Deciding on this recommendation acknowledged the feeling that if the state were to agree to a major increase in stipends or total remission of tuition for graduate students on RA appointment, the costs would be transferred to grants anyway.

The issue is far from settled and it will undoubtedly be a major item in the next *Badger Chemist*. • •

NEW BADGER CHEMISTS

BS

BUBOLTZ, JEFFREY T.
 BUTLER, CLAUDIA M.
 FUERST, DAN C.
 GAUTHIER, MICHELLE M.
 HOLLOWAY, SUSAN A.
 KOCH, MARTIN G.
 LA PEAN, LORI A.
 LARSON, MICHAEL J.
 MILLER, LAWRENCE W.
 MIU, YICK-KAU
 MUNDT, ANDREW A.
 NEEB, MICHAEL J.
 NGUYEN, TRUNG N.
 OPPERMAN, DEANNE R.
 PIATEK, CATHERINE A.
 RAUH, R. JEFFREY
 ROACH, MATT J.
 SHELDON, MARK A.
 SHEPPARD, TERRY L.
 STICKA, TRACY L.
 SWEET, MITCHELL S.
 SYKORA, ANN M.

MS

ASUKE, TETSUYA (WEST)
 BIRKE, SEAN R. (MCMAHON)
 BYERLY, SHANNON K. (CORN)
 KOMPLIN, NORMA (ELLIS)
 LORENZEN-SCHMIDT, HEIKE (WOODS)
 MOASSER, BAHAM (CASEY)
 NANDI, SREELA (WOODS)
 NORMAN, RICHARD L. (DAHL)
 SLATTUM, PAUL M. (ZIMMERMAN)
 YARITZ, JOSEPH (SCHRAG)

PHD

BOWE, MICHAEL D.
 (REICH) Lithium-Selenium Exchange Reaction: Configurational Stability of Unsubstituted and Sulfur and Selenium Stabilized Organolithium Reagents
 CAMPBELL, DEBORAH J.
 (CORN) Second Harmonic Generation Studies of Chemisorption at Electrode Surfaces

COLBERT, DANIEL T.
 (SIBERT) Mediated Photodissociation of Hydrogen Peroxide and Variable Curvature Coordinates for Molecular Vibrations

CURTIN, LARRY S.
 (PIETRO) Doping and Anion-Exchange Thermochemistry of Polymeric and Crystalline Molecular Conductors

DECATUR, JOHN D.
 (FARRAR) The Molecular Structure and Dynamics of Phosphite and Methyl Isocyanide Determined by Nuclear Magnetic Resonance Relaxation

DIECKMANN, GUNNAR
 (ELLIS) I. Electroluminescence from Hydrogen Uranyl Phosphate. II. Indium-Substituted Bismuth Copper Oxide Superconductors

ERDMAN, DAVID T.
 (VEDEJS) Studies Towards Asymmetric Catalysis Based on Tin

FANTA, ALAN D.
 (WEST) 1. The Carbonyl Chemistry of Tetramesityldisilene; 2. Formation and Reactions of 1,3-Diphospha-2,4-disilabicyclo[1.1.0]butanes

FIELDS, STEPHEN C.
 (VEDEJS) Synthesis of Optically Active Alkyl-Amino Acids via Boroxazolidinones

FLECK, THOMAS J.
 (VEDEJS) Phosphorus and Sulfur Studies: Mechanism of Stabilized Ylide Wittig Reactions and Studies on Sulfur Mediated Routes to Ring Expansion

FRIEDRICHSEN, BERNARD
 (WHITLOCK) Sterically Encumbered Functionality: The Synthesis of Phosphorus-Containing Macrocycles and the Investigation of the Complexation of Neutral Guests by Endo and Exo Phosphoryls Utilizing ^1H and ^{31}P NMR.

HAIGHT, ANTHONY R.
 (VEDEJS) Intramolecular Activation of Tin-Hydrogen and Tin-Carbon Bonds

HAMROCK, STEVEN
 (SHERIDAN) Photoaddition of N-Methyltriazolinedione to Arenes

HANTON, SCOTT D.
 (WEISSHAAR) State Specific Reactions of Gas Phase Transition Metal Cations with Small Alkanes

HEYDINGER, JENIFER A.
 (ZIMMERMAN) The Photochemistry of Arylcyclopropanes: Investigation of an Unusual Alkyl Migration

HUNSBERGER, LYNN R.
 (ELLIS) I. Structural, Spectroscopic, and Mechanistic Studies of the Alkylammonium Uranyl Phosphates. II. Crystal Structures of the Layered Solids, Hydrogen Uranyl Phosphate and Hydrogen Uranyl Arsenate

HURST, GREGORY B.
 (WRIGHT) Line Narrowed, Fully Resonant Non-linear Spectroscopy of Perylene in Poly(methyl methacrylate)

JABLONSKY, MICHAEL J.
 (FARRAR) NMR Relaxation Time Studies of Molecular Structure and Dynamics in Solution

JACOB, ANTHONY T.
 (ELLIS) Preparation, Reactivity and Optical Properties of Lamellar Derivatives of Hydrogen Uranyl Phosphate and Arsenate

LOO, JEFFREY F.
 (FARRAR) Quantitative Analysis in Gas Chromatography/Low Power Atmospheric Pressure Helium Microwave-Induced Plasma Atomic Emission Interferometry and Ion Cyclotron Resonance

LUEBKER, ELIZABETH R.
 (ELLIS) Photoluminescence and Photoelectrochemistry as Probes of the Interface Properties of Surface-Modified Semiconductors

MEYER, GERALD J.
 (ELLIS) Photoluminescence as a Probe of Semiconductor-Gas Interfaces

MURPHY (JONES), CATHERINE A.
 (ELLIS) Photoluminescence as a Probe of Coordination Chemistry at the Semiconductor-Solution Interface

NELSON, JOEL T.
 (PIETRO) Theoretical and Electrochemical Studies of Electron Delocalization in Polysilane and Borazine Based Molecular Systems

PARMENTIER, LAURA E.
 (O'LEARY) Mechanistic Studies on Aspartate Transcarbamylase Using Heavy Atom Isotope Effects

PELISKA, JAMES A.
 (O'LEARY) 1. The Use of Sulfate Esters to Study Enzyme Catalyzed Phosphoryl Transfer. 2. The Generation and Ketonization of Enolpyruvate in Aqueous Solution

PETERSON, KIRK A.
 (WOODS) Ab Initio Calculations of the Rotational and Rotational-Vibrational Spectra of Molecular Ions

PETRMICHL, RUDOLPH H.
 (WOODS) Microwave Spectroscopy and Mass Spectrometry of Molecular Ions in Flow Discharges

PISCOPIO, ANTHONY D.
 (BURKE) Application of the Lactonic Enolate Claisen Rearrangement and a Novel Retro Hetero Diels-Alder Intramolecular Diels-Alder Process to the Synthesis of Indanomycin (Antibiotic X-14547A) and Pulo'upone

PRICE, BRADFORD B.
 (WRIGHT) Fluorescence Line Narrowing and Non-linear Spectroscopy of Octaethylporphine

RITTER, DAVID
 (WEISSHAAR) Kinetics of Neutral Transition Metal Atoms in the Gas Phase

SCHAFFER, FREDERICK T.
 (SCHRAG) Oscillatory Flow Dichroism and Oscillatory Flow Birefringence of Macromolecules in Solution

SKARLUPKA, RANDY J.
(YU) Polymer/Polymer Interfacial Dynamics by Electrocapillary Waves

TOMCHICK, DIANA R.
(DAHL) Synthesis, Characterization, and Theoretical Investigations of Several Organometallic Molybdenum Compounds

VANDERWAL, RANDALL L.
(CRIM) The Vibrationally Mediated Photodissociation of Water and HOD

WHIPPLE, WESLEY A.
(REICH) 1. The Investigation of the Formation of 1,3-Dipoles from Silyl Ketones; 2. A Study of 2-Lithio-5-methylthiophene and Its Role in the Lithium-Iodine Reaction

ZEBROWSKI, JEFFREY P.
(DAHL) Synthesis and Characterization of Mixed-Transition Metal Carbonyl Clusters and Nickel-Germanium and Nickel-Tin Carbonyl Clusters

STUDENT HONOR ROLE

Cathy Murphy (PhD '90, Ellis) was named recipient of a NSF postdoctoral fellowship; 17 of these prestigious awards were made in Chemistry last year. This is the second year for the NSF program, which is intended to attract talented PhDs into academic careers. The Fellowship provides an annual \$26,000 stipend for one or two years and has the provision for a \$32,000 start up grant if the candidate assumes a faculty position.

David B. Adolf, a fifth year student with Mark Ediger, was named to receive the first John D. Ferry Fellowship. This two year graduate fellowship, awarded in national competition by the ACS, is administered by the Education Committee of the Rubber Chemistry Division.

GRADUATE FELLOWSHIPS

Several graduate fellowships, made available through industrial gifts to the Department, are awarded each year. The Department Fellowship Committee screens nominees for these awards and makes a recommendation on awardees. Fellowship recipients for the 1990-1 academic year include (major professors noted in parentheses):

Amoco Fellowship: Greg Huey (Crim)
P & G Fellowship: Joel Harrington (Weisshaar)
Grace Fellowship: Patricia Wang (Zimmerman)
Squibb Fellowships: Namkyu Lee (Vedejs),
Anthony Piscopio (Burke), Warren Porter (Burke)
BP Fellowship: Gui-Bai Liang (Gellman)

OUTSTANDING TA AWARDS

Teaching Assistant Awards for 1989-90 were given to (major professor in parentheses): **Jeffrey Bartz** (Crim), **Michael E. Kort** (Burke), **Juliette M. Lantz** (Corn), **Marcus T. McEllistrem** (Hamers), and **John D. Thoenke** (Crim).



Gerry Brenner (PhD '61 Van Tamelen) is in his 29th year with Merck, Sharp and Dohme Research Laboratories.

Joseph E. Brenner (PhD '58, Van Tamelen) has worked for DuPont since 1960, and since 1965 has been in Geneva, Switzerland where he is involved with Corporate Planning and Development for Eastern Europe. He served as a TA for Larsen and Margrave, 1954-56.

Bruce Brown (Postdoc '75, Willard) is Principal Research Scientist with the Australian Air Force.

David Buchanan (BS '64, PhD '69, Whitlock) has just completed his first three years as Chair at Eastern Illinois. He writes that there are now 3 or 4 Whitlock students from his era who are Department chairs.

Laura (Drischer) Burg (secretary to the late Professor Mathews) and **Clifford J. Burg** (BS '37) were married in 1939 and then moved to Ohio where Cliff worked at the Ohio Rubber Co. and then at B. F. Goodrich. After retiring in 1977, they have moved back to Wisconsin.

Edward Burgoyne (PhD '49, Atkins) retired in 1983 after 33 years at Arizona State University. In reference to Chuck Curtiss' article in BC-34 he added: "...One had the choice of stifling in a hot laboratory, or opening the windows and getting the bugs, attracted by the lights, into to everything. When I was there (1946-49) we had that problem on the third floor of the west end of the building where I was sharing a lab with Bruce Hoertz, Harold Rice, and Robert Ross. I got permission from Professor Adkins to build two large screens which we could insert in our windows. Unfortunately, the bugs came through the screens. I had read about some new insect repellents, one of which was n-butyl phthalate, so I took some phthalic anhydride and n-butyl alcohol and made some. I stirred it into some varnish and applied it to the screens. It worked very nicely..."



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Mike Chen (PhD '79, Gaines) visited UW-Madison to interview students for a number of positions at Union Carbide, in October.

Nigel Cockcroft (PhD '89, Wright) is a postdoc at Los Alamos National Lab.

Martin Cohen (PhD '79, Reich) is currently a Group Leader of the Photochemistry Group at the Chemical Research Division of American Cyanamid.

Richard Crane (PhD '89, Treichel) and **Kathleen Bonnin** (BS '88) were married in October; Richard currently holds a postdoctoral appointment at SMU.

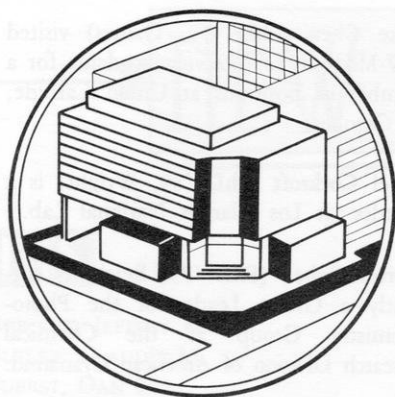
Recent Dahl group PhDs include: **Mike Ziebarth**, now at Grace Chemical Co; **Terry North**, at Molecular Design, Inc.; and **Jeff Zebroski**, a postdoc at Argonne Labs. **Rick Norman** (MS '90, Dahl) is at Akzo Coatings, Chicago, IL.

Edward Dismukes (PhD '53, Alberty) received the Southern Research Institute Scientific/Engineering Excellence Award for work to develop defensive measures against chemical warfare agents and air pollution control.

Gary Edverson (PhD '89, Gaines) is on the faculty of Moorhead (MN) State University.

William D. Ehmann (BS '52, MS '54, Willard) recently completed 30 years on the chemistry faculty at the University of Kentucky, where he also served as Department Chair and Associate Dean of the Graduate School of Research. His ongoing research, with NIH support, applies nuclear methods of analysis to study of trace element relationships to Alzheimer's disease, ALS, and other neurological disorders.

Art Ellis provided information on 1990 PhDs from his group: **Charles Pechmann**, at Monsanto; **Elizabeth Leubker**, postdoc at Colorado State University.; **Lynn Hunsberger** and **Tony Jacob**, at UW working with ICE and Seraphim; **Cathy Murphy**, postdoc at Caltech; **Gunnar Dieckmann**, postdoc at Max Planck Institute. **Liz Gron** (PhD '87, is a postdoc in Chemical Engineering at the University of Delaware.



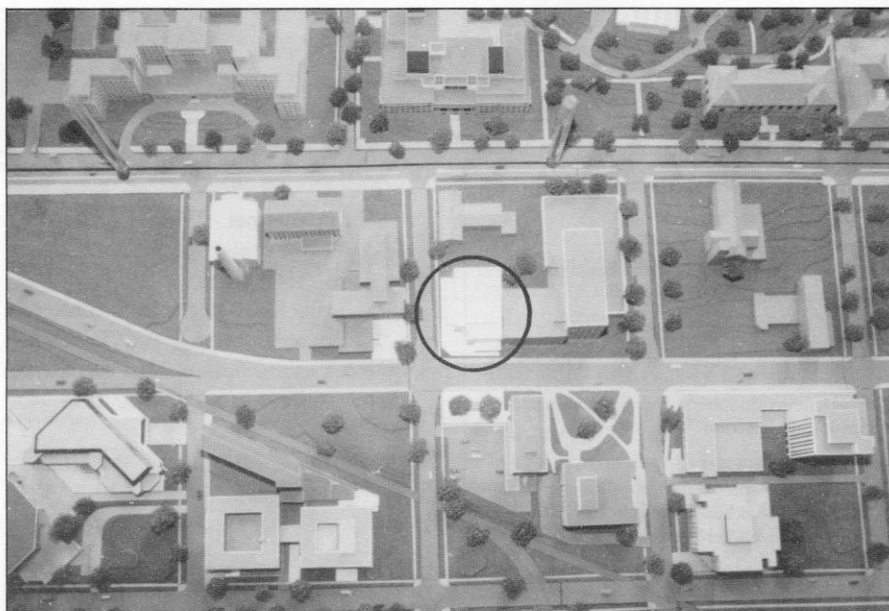
BUILDING ADDITION UPDATE



WE reported on our hopes and plans for an addition to the chemistry building and concurrent remodeling of the existing facility in BC-34. Here is an update on this topic.

In November, 1989, Dan Cornwell and Paul Treichel presented the Department's case to the Campus Planning Committee, the group that advises the Chancellor on needs of the Madison campus. In accordance with the Chancellor's directions, the CPC separated UW-Madison campus proposals into four priority groups. Our project was placed in the highest priority group. Then, in April, 1990, Chancellor Shalala presented the Madison campus's recommendation for the 1991-3 biennium to the UW System. The ranked list of nine projects was headed by CPC's four highest priority projects: 1) a campus utilities improvement project (\$4.94M); 2) the Biotechnology project (\$8.1M toward a total cost of \$27.94M); 3) The Chemistry building addition (\$21.62M); and 4) Classroom renovation (\$3.86M). The remodeling part of our project (\$9.77M) was in the 1993-5 unranked major building project list.

During the next six months the UW-Madison Department of Planning and Construction upgraded the proposal and the UW System began a review that would prioritize projects submitted by all the UW campuses. Perhaps it was a forewarning, but the UW System did contact us in this period to ask questions about the project. (We received a three-



Above: A model of the present Chemistry building and its environs, showing the proposed addition. At left: a detailed look.

page list of technical questions about our proposal from the State Department of Facilities Management.)

In late November, UW System recommendations to the Board of Regents were released. The UW would recommend a capital budget of \$196.5M, including \$56.1M in state funding for new projects. With some fanfare, UW President Shaw announced a major emphasis on repair, renewal and reprogramming of existing buildings. The classroom and utilities projects for UW-Madison, mentioned above, were high on the list. The biotechnology building was there, the major outside funding already in place surely being a factor in this decision. Funds for Chemistry's addition were listed for the 1993-5 biennium with planning funds for the addition included for 1991.

But before the Regents could act, there was a surprise. In an unexpected move, Chancellor Shalala brought the Madison campus case directly to the Board of Regents on December 6, 1990. She proposed that the Board endorse construction of \$225M in new buildings and remodeling over the next 5 years on the UW-Madison Campus, arguing that this would be needed to maintain the University's research reputation and spur job development in the state. Of the total, \$150M would come from state funds. The proposal came with a catchy acronym—FAST (Facilities Advancement for State Technology.) Chemistry's proj-

ects were on the list for immediate action.

The point of the Chancellor's message: many of the existing research facilities on campus are old (average age is 40 years) and new construction on the Madison campus is occurring at about one-third the rate of peer universities and comparable state universities. Investment now is necessary to retain the high quality of the program and the major benefits that accrue to the state, both in research grants and spin-offs of scientific and technological accomplishments.

The Board of Regents seemed to be caught by surprise by this appeal. Although apparently supportive of both the UW System proposal and the Shalala proposal, they decided to put off a decision until their February 6-7 meeting.

Some interesting facts on the university were quoted in the early discussions on FAST. The university spends about \$285M in its research budget, with 85% coming from the federal or private sector. Since most of these funds are spent within the state, its effect on the state's economy is multiplied to over \$1 billion dollars. The \$285M budget makes it the largest, most important, and diverse high technology endeavor in the state, and approximately 260 high technology companies in the state trace their origins to the University or depend on it for access to specialized facilities. The university claims that its stature, current high level of funding, and the prospects for future

enhanced funding, are being jeopardized by inadequate facilities.

Not surprisingly, the FAST proposal was greeted by some skepticism at the state level. Most officials, including the governor, stopped short of either endorsement or condemnation, indicating the need for careful scrutiny of the plan.

Thus, as this article was written, we were still awaiting the Regents' approval on the building proposal. And the biggest hurdles are still to come; we will not know how we fare with the State Building Committee until about April, and then their recommendation will need approval of the state legislature and the governor. Our hope is that the chancellor's proposal succeeds. Minimally, we hope for approval of the UW System's plan that includes planning funds for our project. While not a guarantee that construction will go forward, planning funds will be a significant step in that direction.

Remodeling News

ONE other building/facilities development has occurred over the last few months, peripheral to construction of a new addition. For almost a decade the Chemistry Department has submitted proposals to the university asking for major remodeling of several synthesis laboratories. As end of the current biennium approached, the university decided to provide about \$250,000 for this project. One of the compelling arguments for funding this proposal was that we could develop prototypes for the remodeling portion of the building project. We are planning to upgrade four of the larger ("5 person") laboratories on the fifth and sixth floor, a plan that includes major additions of hoods, relocation and shielding of student desks and work areas, and chemical storage. We are currently evaluating several plans for this project. Construction will be carried out over the next year.



CHEMISTRY BOOK COLLECTION

IN BC-34, we asked for contributions of books authored by UW chemistry faculty. Responses included donations from faculty and staff members (Professors Paul Bender, Chuck Curtiss, John Ferry, Dick Fenske, Aaron Ihde, and John Moore; Paul Schatz and Bruce Adams, and from several readers, notably Elizabeth (Cooper) Wiggert (MS '61, West), Harold Larson (BS '43), Donald S. Saunders (BS '46, PhD '50, Daniels), and Kenneth Schmit (BS '48, MS '50, Daniels).

We now have a nearly complete collection of physical chemistry text and laboratory books. We have all six editions of Getman's *Outlines of Theoretical Chemistry* and a copy of Getman and Daniels, *Outlines of Physical Chemistry*, 7th edition (1946). In the more recent series by Daniels and Alberty, *Physical Chemistry*, we have the 1st Edition (1955), the 2nd Edition (1961), and the 5th Edition.

We also collected the 1st through 6th Editions of *Experimental Physical Chemistry*; this series started with Professors Daniels, Mathews and Williams as authors; later editions added Professors Cornwell, Bender, and Harriman.

Emeritus Professor Paul Bender contributed his copy of the Spanish language edition of the lab text (7th Edition) along with the Asian Students publication of the 5th Edition and Aaron Ihde contributed several copies in translation.

Three gems for the Physical Chemistry collection were provided by Daniels' student Donald Saunders (BS '46, PhD '50, Daniels): Daniels, *Chemical Kinetics* (1938), Daniels and Duffie, *Solar Energy Research* (1955), and Daniels, *The Challenge of our Times* (1953). Other volumes in this collection are *Equilibrium Statistical Thermodynamics* by Frank Andrews, the two-book set of *Dynamics of Polymeric Liquids*, Volume 2 by Bird, Curtiss, Armstrong and Hasslager, and *Viscoelastic Properties of Polymers* by Ferry.

In the organic area, there were several treasures. Ken Schmit sent us a copy of Atkins, McElvain, and Klein, *Practice of Organic Chemistry* (1940) and Richard Juday (PhD '43, Adkins) provided *Reactions of Hydrogen* (a University of Wisconsin Press book, 1937) by Atkins. They join Marion O'Leary's recent book, *Contemporary Organic Chemistry*, and an old copy of McElvain's *Characterization of Organic Compounds*.

Mitch Dibbs (PhD '83, Schrag, now at Dow

Chemical Co., visited the department and dropped off his copy of Blaedel and Meloche, *Elementary Quantitative Analysis*.

General Chemistry texts included Sorum and Walton, *Introduction to Qualitative Analysis* (1947) and Sorum, *Problems for General Chemistry and Qualitative Analysis* (1947), the 3rd and 4th Editions of Sorum's *Laboratory Manual for Semimicro Qualitative Analysis*, and Volume 4 of Sorum's *How to Solve General Chemistry Problems*.

John Moore gave us copies of his books (Moore and Pearson, *Kinetics and Mechanism*; Moore, Davies, and Collins, *Chemistry*; and *Environmental Chemistry*, which John co-authored with his wife Elizabeth Moore). We also have the three volume set of books on *Chemical Demonstrations*, written by Bassam Shakhshiri.

Finally, we received a very nice letter from Mrs. Dorothy Walton, age 98. The widow

of James H. Walton, she resides in New York City. By way of her daughter in Madison, she sent us a book written by her husband for use by the U.S. Army during World War I. On this, Mrs. Walton wrote:

"During World War I my husband, on leave of absence from the University, was stationed in Washington in charge of the training of our army in gas warfare defense. Every unit of our army sent to Europe then had to have an officer trained in gas warfare accompanying it. All of these men were trained by my husband. The English had sent a military mission to the USA when we entered the war to help train our soldiers. Lt. Col. S. J. M. Auld who had had experience in the actual operation of gas warfare was assigned to my husband to help in his task. The book... is an official publication on gas warfare which was written by my husband with the help of Col. Auld for use by our troops. The War Department never gives credit to any individual for writing their publications—only to the department—but this copy was given to my husband by the War Department with a statement in front that he was the author with the help of Col. Auld."

In the next few years we will continue to fill out our collection, and we thank the donors of the books already received. Books are an important contribution to both the educational and research community of the Department, and this collection will be valued by future generations of students, faculty, and staff. •



SPEAKING OF BOOKS...

A ARON IHDE'S *History of the UW Chemistry Department* is finally available. Publication moved slower than we had hoped, but in August we received six hundred copies of this book and began to mail copies to persons who had requested them. As of this writing, about 300 copies of the book have been distributed. Several journals have also agreed to review this book, including *Chemistry and Engineering News*, *Isis* (the History of Science Journal) and *Technology and Culture* (the History of Technology Journal).

Copies of the book can be ordered on the form provided.

Order Form

Aaron Ihde, *History of the UW Chemistry Department*
xxxx pages, \$25.00 (includes shipping & handling).

Please send _____ copies of Aaron Ihde's *History of the UW Chemistry Department* to:

Name _____

Address _____

City / State / Zip _____

Payment of _____ is enclosed. (Payment must accompany order.) Make checks payable to **The Department of Chemistry, University of Wisconsin.**

Mail to: Paul M. Treichel, *Badger Chemist* Editor, Department of Chemistry, University of Wisconsin, Madison, WI 53706

**THIS
and
THAT**

Ken Fivizzani (PhD '81, Treichel) was promoted to Senior Research Chemist at Nalco. He has worked on iron and manganese dispersancies and on metal-based corrosion inhibitors applied to cooling water corrosion control.

Eldris Rudolfo de Gil (PhD '68, Dahl) and **Francisco Gil 'Arnao** (PhD '69, Larsen) have been at the Universidad de Los Andes in Merida, Venezuela for 22 years. Eldrys was Dean of the Faculty of Science from 1985-8 and is now Advisor to the Ministry of Science. She is working on applications of molten salt chemistry, in particular, directed to recovering vanadium in coke and ashe from petroleum.

Bill Ginnell (PhD '49, Willard), at the Paul Getty Museum, is currently working on methods for preservation of the Dead Sea scrolls and on mitigating seismic damages for museums.

Lou Glasgow (PhD '70, Willard) was named Director of the DuPont Petrochemicals Department laboratories in Wilmington and Texas; these labs are seeking new processes for the production of polymer intermediates.

Stan Hager (PhD '74, Willard) has been promoted to Senior Research Scientist at

Union Carbide. "Ultracel", a new foam cushioning material made without the use of chlorofluorocarbons developed under his leadership, received an R & D-100 citation from Research and Development magazine. Stan is also the inventor of "Geolite", another foam material.

Charles C. Han (PhD '74, Yu), Group Leader at National Institute of Standards and Technology (NIST), recently was awarded their Special Competency Initiative Research Award.

Harold Jeskey (PhD '42, Adkins) reported that his former students contributed \$600,000 to establish a chair in his name at SMU.

Jungsik Lee (PhD '89, Yu) has joined the Spring House Labs of Rohm and Haas.

M. B. Lele (MS, '50, Schuette) wrote from Bombay that he was in the US last year and hoped to come to Madison but was unable to do so.

Joe Norbeck (postdoc and computer manager, '75-'77) is Manager of Chemical Research, Ford Motor Co.

David G. Pauly (BS, '83) joined the GE Research and Development Center in Schenectady as a mass spectroscopist.

David Rae, a visiting professor at Wisconsin in the early '80s, spent a week in

Madison with the Dahl group. While here, he used his RAELS crystallographic programs to unravel the crystal disorder problem in a metal cluster species, $[\text{Ni}_{27}(\text{Sn})_2(\text{SnBu})_6(\text{CO})_{32}]^{4-}$ prepared by the Dahl group.

The UW Library has informed us of a gift of 34 books and 5 large maps on the Arabian Peninsula from **John B. Ramsey** (PhD '54, Meloche).

Marie M. Roth (PhD '52, Schuette) and **Don Roth** (BS '40, PhD '44, Schuette) wrote from Brookfield, WI. Don retired 4 years ago as Chief of Nephrology at Zablocki VA Hospital and then worked part time at the Department of Nephrology at the Medical College of Wisconsin until last summer. They will spend more time with children and grandchildren, as well as traveling.

William J. Scanlon (BS '69) joined the Madison law office of Foley & Lardner. He had previously worked for Cetus Corporation and Upjohn Company and was a Congressional Fellow in the Office of Technology Assessment.

Matthew Schlecht (BS '75) is working in the Chemical Discovery Division of DuPont Agricultural Products, Newark, DE.

Ken Schmit retired from Ethyl Corporation and he and his wife have moved from Baton Rouge, LA to Prescott, AZ.

Harry Schultz (BS '42, PhD '48, Adkins) retired in 1984 after 37 years on the University of Miami faculty, the last 12 as chairman. He continues to help out, most recently by teaching his favorite course—Honors Organic Chemistry.

Marietta (Haeg) Schwartz (PhD '88, Whitlock) is an Assistant Professor at the University of Massachusetts, Boston Harbor Campus. She and **Eric Schwartz** (PhD '88, Vedejs) were married in June, 1989. After a postdoc appointment at the U of Pittsburgh for two years, Eric is with the Eisai Research Institute in Andover, MA.

Thor Smith (PhD '48, Ferry) was elected to the National Academy of Engineering. He is employed at the IBM Almaden Research Center in San Jose, CA.

Gail Steehler (PhD '83, Gaines) was a visiting fellow at an Institute for Chemical Education workshop in Madison in July. She and husband **Jack** (PhD '85, Wright) are faculty members at Roanoke College, in Virginia.

Marcel Vrancken (Postdoc '55-'56, Ferry) is employed by Agfa, in Belgium; he writes of his career in basic research, product development, marketing, quality assurance and, finally, strategic planning.

Lixiao Wang (PhD '88, Yu) joined SciMed Corporation, Maple Grove, MN.

Jeffrey Wesson (PhD '83, Yu) recently resigned from Eastman Kodak to start a medical career at the Wisconsin College of Medicine.

Eugene Woroch (BS '44, PhD '48, Johnson) retired from Abbott Labs in 1986 after 28 years in research and research management. In 1988 he was elected to the Board of Directors of the Clara Abbott Foundation, which administers a trust fund set up by the widow of the founder of Abbott. This fund provides scholarships for deserving offspring of present and former Abbott employees.

Howard Zimmerman furnished information on recent graduates: **Jenny Heydinger**, at Lubrizol Corp.; **Jerry St. Clair** and **Drew Weber**, at DuPont; **Frank Oaks**, at Dow; **Mike Zuraw**, at Polaroid; **Paul Lamers**, at PPG.



Orlan McGrew Arnold died on November 9, 1989. He was born in York, Nebraska, where he received his early education; he then proceeded by way of Grinnell College to the University of Wisconsin where he received a PhD in 1934 (Williams). After teaching at Rensselaer Polytechnic Institute for nine years, he joined Chrysler Corporation, serving two years as Head of the Fundamental Physical Chemistry Research. He then organized and directed Ajem Laboratories in Livonia, Michigan. During the next 27 years there, his research concentrated on cleaners involving measurements of air and water pollution, and on textiles and plastics involving recovery of waste materials. He consulted with textile and plastics industries on water and air pollution problems, an activity which he continued at the Peabody Corporation when he left Ajem in 1973. He was responsible for over 500 patents being issued; over 100 were for his own inventions.

Richard B. Bernstein died on July 8, 1990 at the age of 66. He had served as a faculty member in the department from 1963 until 1973. In 1966 he was awarded a University Houses Chair which he chose to name after W. W. Daniells who had served as Professor of Chemistry in this department from 1868-1907. Before coming to Wisconsin, he held faculty positions at Illinois Institute of Technology and Michigan; after leaving Wisconsin he moved to the University of Texas, and then to Columbia University, his alma mater. In 1982 he left academia to become senior vice president of Occidental Research Corporation. He was a gifted experimentalist and theorist, and his work earned him many honors including the ACS Peter Debye, Irving Langmuir, and Willard Gibbs awards, and in 1988, the Robert A. Welch Award. He was a member of the National Academy of Sciences.

The death of **Ralph Connor** (PhD '32, Adkins) on May 1, 1990, was reported in C & EN. Dr Connor held faculty positions at Cornell and Pennsylvania where he worked on hydrogenation catalysis, organosulfur chemistry and organic mechanisms. He joined Rohm and Haas in 1945 and in 1948 became Vice President in charge of research; he also served on the Board of Directors from 1948 until his retirement in 1972. From 1956 through 1958 he was chairman of the ACS Board of Directors. He received the American Institute of Chemists Gold Medal in 1963 and the ACS Priestley Medal in 1967.

Emeritus Professor **Joseph O. Hirschfelder** died in Madison on March 30, 1990; see article on page 7.

John A. Peterson (BS '48, MS '50) died on September 2, 1989.

Albert J. Schlaeger (PhD '44, Schuette), died on February 4, 1990 at the age of 70. He had worked for 18 years at Unichima in Chicago and retired as Director of Research three years ago.

SYMPOSIUM HONORS HARLAN GOERING

THE Department honored Professor Harlan L. Goering's retirement with a scientific symposium and banquet on October 13, 1990. Twenty-seven of Harlan's former students and postdoctoral associates returned to Madison to celebrate Harlan's contributions to their educational careers, the science of organic chemistry, and the chemistry department at UW-Madison.

Former Goering students David Cosper (Nalco), Divakar Masilamani (Allied-Signal Biotechnology), and Martin Sloan (Hercules), along with other former Wisconsinites Ronald Anderson (Amoco; Ph.D. with Casey), Stephen Harsy (Grace; Ph.D. with Casey), Steven Neumann (Eastman Kodak; Ph.D. with Casey), Steven Peake (American Cyanamid; Ph.D. with Reich), and Dennis Powell (Lederle; Ph.D. with Vedejs) assisted in raising industrial support for the symposium.

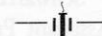
The scientific symposium consisted of plenary lectures by four distinguished chemists and close friends of Harlan: Professors Henning Hopf, Albert Eschenmoser (ETH, Zurich, Switzerland), Charles J. Sih (Wisconsin), and Barry M. Trost (Stanford). During the luncheon break held in the Great Hall of the Memorial Union, 36 current graduate students and postdoctoral associates in the department presented recent research results in a

poster session. Approximately 200 people attended the symposium.

Following the scientific program, 82 former students, colleagues, and friends of Harlan and Margaret gathered at the Concourse Hotel for a festive banquet, with Master of Ceremonies Hans Reich presiding. Professor Stanley J. Cristol, Harlan's Ph.D. advisor at the University of Colorado, provided a humorous account of "the early days" and other personal anecdotes based on his long friendship with Harlan. Professor Jean Umland (University of Houston), Harlan's first Ph.D. student, presented Harlan with a gift from his former students and postdoctoral associates. Several friends and colleagues provided personal reminiscences and tributes. Many speakers described Harlan's sense of humor and his support, concern, and caring for other persons. Professor Jerry Berson (Yale University), a former colleague at UW-Madison, reminded the audience that the occasion for the gathering was not simply to honor Harlan as "pater familias", but also to honor his distinguished scientific career!

Professor Bob McMahon read excerpts from letters sent by friends and colleagues who were unable to attend, including Nobel Laureates Derek Barton, Herb Brown, Don Cram, and Welch Awardee Jack Roberts. Harlan thanked

Hans and Ieva Reich for organizing the day's events, and addressed the gathering with the theme that the quality of his reminiscences is high because he has been fortunate to know good and interesting people. The evening concluded with a standing ovation.



HARLAN L. Goering was born in McPherson, Kansas on July 13, 1921. He received an A.B. degree in chemistry from Bethel College in 1943, where he met Margaret Ebersole, and the two were married when she graduated in 1944. Harlan began graduate school at the University of Colorado, Boulder in 1943, but his work was interrupted after one year when he was drafted. After basic training he was assigned to work as a chemist at the U.S. Radium Corp. He returned to Boulder in 1945, and obtained a Ph.D. in organic chemistry in 1948, working with Stanley J. Cristol and Karl Dittmer. Following postdoctoral work at UCLA with Saul Winstein and Bill Young, Harlan joined the Chemistry Department at Wisconsin as an instructor in 1950 and advanced to assistant professor of organic chemistry in 1952, achieved tenure in 1956 and was named a full professor in 1959. He was named Samuel M. McElvain Professor of Chemistry in 1972. When he came to UW, the active organic research groups were those of Bill Johnson, Sam McElvain, Gene van Tamelen, and Al Wilds, later joined by Jerry Berson, Hans Muxfeldt, Howard Whitlock, and Howard Zimmerman.

Harlan quickly established a distinguished international reputation as one of the pre-eminent physical-organic chemists of his time based on his brilliant studies revealing the nature of ion-pair intermediates in solvolysis reactions. He also pioneered the use of chiral shift reagents in NMR spectroscopy. In recent years, he investigated the nature of organocuprate reagents and the mechanisms of their reactions with organic substrates.

Harlan directed 50 Ph.D. students and 25 postdoctoral associates, and published 119 research articles. He played an important role in shaping the current Organic Chemistry Division. During his tenure as chairman of the Organic Division (1960-1972), Chuck Casey, Steve Nelsen, Marion O'Leary, Hans Reich, Barry Trost, and Ed Vedejs joined the faculty.



Left to right: Kresimir Humski, University of Zagreb, Yugoslavia (PD '67-'68; Visiting Professor '78, '83); Ernest Linsay, Aqualon Co. (PhD '68); Divakar Masilamani, Allied Signal (PD); Harlan; Charlie Brown (PD); Dick Thies, Oregon State (PhD); Garry N. Fickes, University of Nevada, Reno (PhD '64); David Cosper, Nalco (PhD '69); Henning Hopf, Technischen Universitat, Braunschweig (PhD '67, Visiting Professor '78-'79)



REFLECTIONS OF A DEPARTMENT CHAIRMAN

Richard F. Fenske, Department Chairman from 1972-1977, retired in 1989. He now holds Emeritus status.

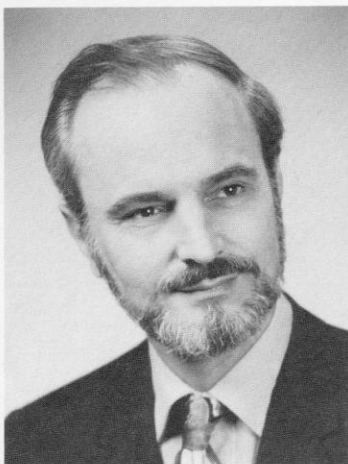
NOW that I'm separated by both time and distance from the Chemistry Department and my Emeritus status allows me an opportunity for reflection, it is possible to look back on various aspects of my professional career with a bit more objectivity. One facet of that career was my five years as Chairman of the Department. In retrospect, it is interesting to recollect how it happened, why I took it; and whether or not it was worth it.

I had been in the Department only ten years, my research program was going well, and my involvement with General Chemistry had led to my appointment as Chairman of that Division. In the latter capacity, I had shepherded through the Department the concept that teaching General Chemistry was a responsibility of the entire Departmental faculty and not just that of the Inorganic Division. (When I and several others were hired, we were part of the General and Inorganic Division so this was a non-trivial structural alteration for the Department). Perhaps it was this display of tight rope walking that led a couple of my colleagues to approach me when the present Chairman (John Willard) indicated that he did not wish to continue. They suggested I should be willing to make myself available for the position. Ultimately the search committee did recommend me to the Department.

From my present perspective, my reasons for accepting the position are obvious. First of all it is an almost irresistible ego stroke when your colleagues, for whom you have a great deal of admiration, ask you to become their spokesman and leader. Secondly, I was 42 years old and there is a phenomenon that is sometimes called "middle-essence" (akin to adolescence) that makes one susceptible to new challenges and the potential for career changes. Thirdly, I really felt the Department could use the leadership that I could provide. Of course, at the time it was this latter motive that was foremost in my mind!

It is indicative of the campus-wide respect for the Department that Dean Kleene appointed me as Chairman at the recommendation of the Department without having a meeting with me. In fact, prior to that time, I had never met the Dean. At our first meeting his memorable words to me were: "Your supplies budget was overdrawn by \$40,000 in this last fiscal year. Do NOT let this happen again." So much for the honeymoon period! Frankly, I had no idea how much our departmental budget was. The next two months were spent in a crash course in departmental finances while simultaneously getting a research lecture ready for an international meeting in Canada. I remember one night after 1 A.M. staring at the paintings in the Chairman's office of two of my illustrious predecessors and saying aloud, "You guys had it easy."

Technically, according to the statutes of the University, the



Chairman has no real "power." His or her role is to carry out the administrative wishes of the Executive and Departmental Committees. He is a "Chairman" and not a "Head." Nevertheless, he does have a great deal of authority. It is vested in him by the tacit approval of the Department for his decisions. It is expected that he does keep an eye on the budget (not to mention other weighty matters such as the research space allocations, the parking spaces for faculty and staff, etc). Furthermore, it is precisely this knowledge that gives him the "power" of the office.

First and foremost, the Chairman is expected to be fair and equitable in dealing with the diverse needs of the department.

Frequently these needs are at conflict with one another. For example, organic chemists need *departmental* instrumentation (NMR, mass spec, etc.) while physical chemists require a highly skilled machine shop for the production of "one-of-a-kind" instruments. Can you require a cost charge-back for spectra from the instrument complex while providing "free" use of machine shop personnel? Never! It is this fairness in the actions and recommendations of the Chairman that allow him to continue to enjoy the confidence of the Department. And one thing I discovered to my amazement was that the "perception of fairness" was even more important than fairness per se.

THE above illustration is a reflection of the era in which I was Chairman (from 1971 to 1976). It was a time of cut-backs in support from both federal and state sources relative to the rate of inflation. Any administrative creativity that I possessed was spent primarily in seeing that reductions took place in areas that did least damage to the professional standards of our Department in both teaching and research. By and large it was not glamorous but very time consuming. One of the unwanted by-products of setting priorities with limited resources is the necessity to say "no" to friends (or putting the request far down on the list, which is essentially the same thing). It can really strain friendships since we all view our own needs as being of primary importance. It was one aspect of the position that I disliked.

I can look back on one successful coup during my tenure of office. It dealt with the acquisition of our first departmental mainframe computer. Up until then, all computer time was purchased from the University Computing Center using "real" funds either from research grants or the Graduate School. Money that could have supported grad students had to be funneled to pay for CPU time and other associated expenses. Departmental computers were considered too costly. However, IBM 7094 mainframe computers were being replaced in the University computing system with new generation equipment



Former Chairmen Daniels, Shain, Ferry, Mathews, and Willard with longtime Department Secretary Betty Germann (1968 photo).

that was entirely free of vacuum tubes. The 7094's were being "salvaged" and hence available to any University unit that could make use of them. A grad student, Al Christoph, who worked for Joe Hirschfelder, heard about their availability and tried to interest TCI in acquiring one, but to no avail. So Al approached Howard Whitlock and the two of them came to me. From personal experience, I knew how costly computer time was to those of us who had to purchase it. But how were we to get around the prohibition against Departmental computers? Two objections had been lodged. First, the computer would need special air-conditioning which departmental facilities did not possess. Second, the overall maintenance and operating costs would be greater than that provided by the newer "cheaper" services of the computing center.

What the University official didn't know was that in designing the TCI facility, Joe Hirschfelder had wisely insisted on additional air-conditioning capacity. And the official underestimated the resourcefulness of Christoph and Whitlock who located not one but two 7094's so the second could be used for spare parts if needed. My contribution was not to request approval for the computer, which had been rejected, but to propose an "Experiment" to study the cost-effectiveness of a Departmental 7094 for a period of six months with all direct and overhead costs being carefully benchmarked against the amount of calculations being carried out. That is administrative creativity! Who can object to a careful experiment to test the correctness of two opposing views? Well, to be honest, the Computing Center still objected since they realized

that we posed a real threat to their monopoly. But Irv Shain was Chancellor and the "Experiment" gave him the lever that allowed him to overrule the decision and let us proceed. Needless to say, our experiment was an overwhelming success, and the Departmental computing center has grown ever since.

From my present perspective I now know that a departmental computer was inevitable. The issue now is the growth of individual research group computers. Nevertheless, the Department got a good five year jump on other departments throughout the country at a substantial cost savings and, more importantly, we had the opportunity to pursue more time-consuming calculations that we might have been reluctant to consider if each CPU minute had to be paid for in grant dollars.

The above illustrates one effect of being Chairman. One's creativity becomes directed away from "Chemistry" and toward "Chemistry Department." It is a very subtle thing, hardly noticeable at first, but ultimately it does affect one's research program. One has less time for research conversations with one's grad students and colleagues. A seminar gets skipped because of a conflict with a meeting with the Dean. Issues of journals go un-read. Research papers get published at a slower rate.

So was it worth it? Absolutely. It filled a need I had at the time. I was useful in advancing science by helping to create an atmosphere where the teaching and research of the entire department could thrive. There are many things a Chairman does to help his colleagues reach those goals that are known by few people other than himself, but HE KNOWS—and that's enough. •

This Badger Chemist
breathes the glory
of Wisconsin today,
a Wisconsin inspired
by the vision of her
Past and secure in
the courageous
flame of her Destiny



Home of the West